

DEPARTMENT OF MARINE AND FISHERIES, CANADA.

METEOROLOGICAL SERVICE.



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No. 1.

INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the material used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

REMARKS UPON THE WEATHER.

On the Islands of British Columbia the weather was comparatively mild and wet up to the 9th, when it turned fine and continued so to the 16th, rain or snow again being recorded almost daily to the end of the month. Over the lower mainland rain was general up to the 6th, after which, with the exception of rain on the 8th and 9th, there was almost continuous fair weather to the 15th. From the 16th to the 31st, rain or snow occurred daily excepting on the 28th. Over the upper mainland much finer weather prevailed, more especially between the 6th and 17th, and the precipitation was mostly snow. Altogether the weather in this Province was somewhat dull and mild and the precipitation at most places was light.

In the North-west Territories there were as usual somewhat rapid changes of temperature, this being more especially the case in Alberta, where it was quite mild at most places from the 2nd to 6th, 13th to 16th, and 21st to 24th. During similar short periods the daily range of temperature was in some instances between 40° and 50° at stations east of Alberta. In most districts the weather was comparatively mild but clouded skies were quite frequent. The precipitation, which was more general during the second half of the month, was somewhat heavy in the northern portion, and light in southern localities. In many districts not any was recorded.

The weather in Manitoba, as in the Territories, was milder than usual and there were somewhat rapid changes of temperature, the daily range in some instances exceeding 50°. Cloud and sunshine followed in quick succession, but dull weather was more prevalent than usual. In most districts the snowfall was somewhat light but at a few places it was heavy and there was generally good sleighing throughout the month.

The weather in Ontario was mild up to and including the 4th, rain falling on the night of the 2nd. On the 5th colder weather set in, and it remained so up to the 15th, when the temperature rose at many places above the freezing point. Two days later it again turned cold, very low temperatures being recorded on or about the 19th in northern and eastern districts. On the 21st and two following days it was comparatively mild, this being followed by three cold days. On the 27th it became quite mild and continued so to the 30th, a heavy westerly gale then setting in and the temperature falling. Throughout the month, clouded skies were unusually frequent, nevertheless in most places the precipitation was comparatively light. There was fair sleighing up to about the 30th, when most of the snow in southern districts disappeared. Thunder was recorded at many places on the 29th.

In the Province of Quebec, the weather was mild from the 1st to 4th, then cold from 5th to 26th, when the temperature dropped below zero each day at most places. From the 27th to 30th it was comparatively mild, but again turned quite cold on the 31st. Clouded skies were frequent but in most districts the precipitation was not heavy. High winds occurred on or about the 18th and last two days of the month, when the snow was much drifted. In western districts there was much bright sunshine from the 4th to 7th, and 18th to 26th.

The weather in New Brunswick was quite mild from the 1st to 5th, also on or about the 11th and 12th, 17th, 21st, and 28th to 30th, the intervening periods being cold with temperatures on many days well below

zero. The sky was frequently overcast and the amount of bright sunshine was deficient, nevertheless there was much fine weather between the 7th and 14th, and 19th to 26th. Heavy snow occurred on the 12th, also snow or rain on the 21st, and there were less important falls, but at most places the total quantity was deficient.

In Nova Scotia the weather did not depart much from the normal but there were frequent and sudden changes in temperature, and high winds were also rather frequent. Mild conditions prevailed from the 1st to 5th, also on the 12th, 17th, 21st and 22nd, and from the 28th to 31st, temperatures below zero being recorded at many places upon several occasions during the intervening cold periods. Heavy snow occurred in many districts on or about the 7th, and there were several lighter falls, but somewhat frequent rains and high temperatures quickly melted it and the ground was almost bare in the southern portion on the 31st.

The weather conditions in Prince Edward Island were similar to conditions in New Brunswick, the dates of change of temperature being practically coincident and the daily minima between the 9th and 27th being frequently below zero. Heavy rain occurred on the 22nd, and much of the snow on the ground disappeared on that date.—F. F. PAYNE.

ATMOSPHERIC PRESSURE.

Atmospheric pressure was subnormal through Canada, except in Northern British Columbia, where at Barkerville an excess of 0.05 of an inch occurred. The greatest deficiency, 0.20 of an inch, occurred at Father Point, Que., and Chatham, N.B. The average departure from normal was 0.12 of an inch.

HIGH AREAS.

Ten areas of high pressure were tracked during the month. Six first appeared in the North-west and four in the West, the latter apparently moving into the continent from the Pacific Ocean. The general path of the areas was well to the southward, only two travelling directly over Canada.

No. 1 was a moderate area which passed between the 1st and 3rd from the South Pacific coast north-eastward to Manitoba and then dispersed. No. 2 lay over the Pacific States between the 3rd and 6th, developing two defined foci. The south portion of the system passed over California, Nevada and Utah to the South-west States, the northern portion near the International Boundary into Montana, thence southward, when the system again united, and with considerably diminished energy reached Florida on the 9th. No. 3 appeared in the northern portion of the North-west Territories on the 8th, and travelling rather quickly south-eastward it passed off the Virginian Coast on the 10th. It was unattended by any unusually cold weather. The path of No. 4 was not unlike its predecessor, except that from the North-west Territories it was more to the southward, and that it passed off the United States Atlantic Coast also more to the southward. It was accompanied by very low temperatures in the North-west, and carried its zero weather far to the southward. No. 5 passed from the Middle Pacific States to Tennessee between the 12th and 16th and then broke up. No. 6 appeared in the North-west Territories on the 17th. On the 19th its centre moved over Ontario, and on the 20th skirted the Nova Scotian Coast. During the presence in Canada of this area, which was of much importance, some very low temperatures were recorded. No. 7 was situated in the North-west Territories on the 19th, and moving southward it eventually on the 23rd passed off the coast of the South Atlantic States. No. 8 also first appeared in the North-west Territories, but after passing southward to Manitoba its course on the 23rd was changed to the eastward, its subsequent path being over Ontario, Quebec and the Maritime Provinces. It was one of the most pronounced areas of high pressure of the month, and was attended by some decidedly low temperatures, especially in northern localities. No. 9 seems to have possessed much energy, when on the 25th it was over Northern British Columbia. It afterwards, however, quickly diminished in importance, and finally on the 28th dispersed over Manitoba. No. 10 travelled from California over the southern portion of the Continent between 29th and 31st, passing on the latter date off the coast of South Carolina.

LOW AREAS.

Thirteen areas of low pressure were sufficiently well marked to allow of their several paths over the Continent being accurately traced, eight moved from the north-westward, two from the westward, two from the south-westward, and one up the United States Atlantic Coast from the neighbourhood of Cuba.

No. 1 appeared on the Texas shores of the Gulf of Mexico on the 1st: it reached the Lower Lake Region on the 3rd, and had passed off the Cape Breton Coast by the 4th. It brought fairly heavy precipitation, largely as rain, from the Lakes to the Atlantic, and the winds meanwhile increased to moderate gales in the Gulf of St. Lawrence and in the Maritime Provinces. No. 2 travelled from Alberta to Kansas between the 2nd and 4th, then by the 6th to the Middle Atlantic Coast, when it developed greater energy, and passed rapidly along the Nova Scotian Coast to Newfoundland as an energetic disturbance, bringing a fall of snow

over Eastern-Quebec and the Maritime Provinces, together with strong winds and gales from the north-east and north-west. No. 3 appeared in Northern Alberta on the 5th, its subsequent course being south-east to Southern Michigan, thence on the 7th over Lake Erie and the New England States, and on the 8th along the Nova Scotian Coast. It caused snow in Canada from the North-west Territories to the Maritime Provinces, but the fall was generally light. No. 4 appears to have moved from the vicinity of Southern Arizona to Texas between the 9th and 10th; thence it travelled rapidly north-eastward, passing over the Lower Lake Region during the daytime of the 11th, and at night across the Maritime Provinces. It was a disturbance which developed great energy as it advanced, assuming very important proportions as it reached Eastern Canada. It caused heavy snow in Ontario and Quebec, and heavy snow and rain in the Maritime Provinces, together with strong winds and gales, the latter being very pronounced on the seaboard. No. 5 travelled far northward over Canada between the 13th and 15th, drawing fresh to strong south-westerly to westerly winds over a considerable portion of the Dominion, accompanied by light local snowfalls and flurries. No. 6 was situated to the northward of Lake Superior on the 16th as a moderate disturbance; however, by the following morning, when it had reached the Ottawa Valley, it had developed considerably, and continuing to increase quickly in energy, it traversed the Gulf of St. Lawrence accompanied by gales throughout Eastern Canada, the storm being especially heavy in the Gulf and over Newfoundland. No. 7 passed, between the 18th and 20th, from Northern British Columbia to the Lake Superior District, its energy quickly diminishing as it approached the latter locality. Moderate snowfalls and high winds prevailed over its course. No. 8 appeared to the southward of Florida on the 20th, and after moving with great rapidity along the United States Atlantic seaboard, its energy at the same time quickly increasing, it traversed on the 21st the Maritime Provinces as a very pronounced disturbance, attended by severe gales, together with heavy snow and rain, while at the same time a heavy fall of snow was experienced over the Province of Quebec, and a moderate snowfall in the eastern portion of Ontario. No. 9 covered the North-west States on the 21st, and then passed over Lake Superior and far to the north-eastward. During its presence there were a few light snowfalls in Canada from the Lakes to the Atlantic, followed by winds attaining to the force of a gale in the Gulf of St. Lawrence and over the Maritime Provinces. No. 10 was a moderate disturbance which moved between the 22nd and 24th from the vicinity of Utah to the South Atlantic States Coast. Owing to its influence some light snowfalls were experienced at the time in Ontario. No. 11 moved from the British Columbia Coast to the Lake Superior district between the 24th and 27th and then broke up. It was attended in the North-west by light snowfalls, and over Lake Superior by light snow and rain. No. 12 appears to have been situated on the 26th and 27th in the Middle Pacific States. Its course was then over the Western States to the Lake Region, thence to the Ottawa and St. Lawrence Valleys and the Gulf of St. Lawrence. It was a disturbance of much energy accompanied by gales from Ontario to the Maritime Provinces together with considerable precipitation, the latter being largely as rain. No. 13 was a moderate depression which was shewn off Vancouver Island on the morning of the 29th, and which, by the 31st, had reached the North-west States.

WINDS.

In British Columbia the direction favoured somewhat the south and east, although there were many days of variable winds. The force of a gale was recorded on at least four occasions, and the gale which set in on the 23rd lasted until the 26th. A period with light to moderate winds prevailed from the 9th until the 17th, and there were twelve days on which the force of a fresh or strong breeze was recorded.

In the North-west Territories the south and west directions predominated. There were fourteen days with strong breezes, eleven with fresh, and from two to three gales.

In Manitoba the south and west directions likewise chiefly prevailed. There were eight days with strong breezes, twelve with fresh, and three gales.

In the Lake Region the direction was very largely southerly to westerly. Strong breezes prevailed on fourteen days, fresh on six, and there were five gales.

In the Ottawa and St. Lawrence Valleys the westerly direction was most in evidence. Fresh or strong breezes were experienced on twenty days, and there were at least three gales.

In the Lower St. Lawrence Valley and the Gulf, the westerly direction was the most general, inclining somewhat to the north. Fresh or strong breezes prevailed on seventeen days, and there were seven gales.

In the Maritime Provinces the direction was mainly west and north. Fresh or strong breezes were experienced on sixteen days and there were seven gales, the latter occurring on the 3rd, 7th, 12th, 18th, 21st, 23rd and between the 30th and 31st.

The heaviest gales were those on the 12th, 21st and between the 30th and 31st. Ample warning was given of the gales occurring in those portions of the Maritime Provinces where winter navigation is pursued,

except the storms of the 7th and 23rd, and the former of these was almost entirely confined to Cape Breton. A warning issued to ocean ports on the 25th was not justified by subsequent high winds.

TEMPERATURE.

The mean temperature of the month was higher than the average over very nearly the entire Dominion, the only districts where a negative departure was registered being the extreme south-west counties of Ontario, the Upper Ottawa Valley, and in far northern regions near Hudson's Bay, and in Athabasca, Yukon and Cassiar. The largest positive departures, between 9 and 12 degrees, occurred in Assiniboia; westward from this Territory the departure diminished to 3° at Vancouver, and eastward to 3° at Lake Superior, whence across Ontario, Quebec and the Maritime Provinces it ranged from average to 2° above.

The Highest and Lowest temperatures in each Province during January, 1903, were :

British Columbia,	62°·5 on 6th at Clayoquot.	—19°·5 on 29th at Golden.
North-west Territories,	56°·4 on 6th at Lethbridge.	—41°·5 on 27th at Athabasca Landing.
Manitoba,	49°·0 on 8th at Portage la Prairie.	—39°·0 on 28th at Bowsman.
Ontario,	52°·0 on 29th at Stony Creek.	—47°·2 on 14th at White River.
Quebec,	43°·0 on 30th at Brome.	—37°·8 on 26th at Chicoutimi.
New Brunswick,	47°·5 on 21st at Sussex.	—24°·0 on 24th at Dalhousie.
Nova Scotia,	47°·0 on 30th at Halifax.	—19°·5 on 11th at Truro.
Prince Edward Island,	44°·0 on 31st at Summerside.	—13°·0 on 20th at Hamilton.

PRECIPITATION.

The precipitation did not differ much from average anywhere except, perhaps, very locally, and this more especially in Ontario where there were instances of positive and negative departures at stations not far distant from each other. In the eastern and northern portions of the North-west Territories the snowfall was rather in excess of the average, but west and south it was deficient.

DEPTH OF SNOW.

At the close of the month snow lay to a depth of from three to five feet over the more eastern portions of Quebec, but southward, over the Maritime Provinces, the depth diminished to a light covering near the Bay of Fundy, and to none in Western Nova Scotia; westward the depth diminished from 55 inches at Father Point and 34 inches at Quebec, to 15 at Montreal, and then to almost nil at Kingston and near the shores of Ontario and Erie, with a moderate covering over the inland counties of Ontario. In Saskatchewan and Northern Alberta the depth was between 12 and 18 inches and less further south.

THICKNESS OF ICE.

Medicine Hat, 20 inches; Swift Current, 25; Battleford, 30; Minnedosa, 23; Port Arthur, 20; White River, 18; Parry Sound, 10; Southampton, 15; Kingston, 6; Arden, 20; Paris, 14; Lucknow, 13; Kinmount, 14; Orillia, 14; London, 10; Gravenhurst, 18; Chatham, N.B., 21; Charlottetown, P.E.I., 13; Fredericton, 21; Sussex, 20; Parrsboro', 15.

BRIGHT SUNSHINE.

Battleford, in Saskatchewan, is the only sunshine recording station in the Dominion reporting an amount of bright sunshine in excess of the average, and this to a very small extent. Ottawa and Victoria registered respectively the largest negative departures. The percentage of the possible amount ranged from 10 at Victoria to 31 at Fredericton.

PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, JANUARY, 1903.

a. Barometer not reduced to Sea Level. • Stations not furnished with Registering Thermometers.

STATION.	Latitude N.	Longitude W.	Elevation above Sea Level, in feet.		Pressure.		Temperature.		Direction of Wind from				Velocity of Wind		Precipitation.		No. of Foggy Days.	No. of Auroræ.	No. of Rainy Days.																
			Highest.	Lowest.	Range.	Mean.	Difference from average.	Years observed.	Highest.	Lowest.	Date.	Mean daily.	Mean relative humidity.	Mean amount of Cloud.	No. of days completely clouded.	Direction of Wind from				Mean miles per hour.	Highest days per hour.	Direction from.	Amount.	Difference from average.	Heaviest fall in month.										
																N.				N. E.	E.	S. E.	S.	W.	W.	N. W.	C.	Total number of hours.							
BRITISH COLUMBIA:																																			
Vancouver	49 04 33	123 05	29 55 30	29 55 30	18 121	36 0	11 9	2 8 12 54 0	3 30 3	28 6 6	28 6 6	28 6 6	28 6 6	28 6 6	14	242	116	57	90	40	82	53	14	10	714	8 4	22 9	24 W	3 94	-1 16	1 03	26	0	4	
Barkerville	53 42 35	121 35	4180	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Agassiz	49 14 31	121 35	521	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Port Simpson	51 34 30	120 36	26	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hazletmere	49 3 12	123 43	1476	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Revelstoke	50 41 20	119 29	1292	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kamloops	49 29 20	120 24	1650	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pilot Bay	49 39 12	120 19	20	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
River's Lot	51 34 30	120 36	1800	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stuart Lake	49 20 12	124 35	1246	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
French Creek	49 20 12	124 35	1246	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goldstream	50 14 19	124 35	1246	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a Naino	49 10 23	123 57	21	30 00 30	52 29 20	1 32	38 0	8 52 0	3 30 8	29 8 8	29 8 8	29 8 8	29 8 8	29 8 8	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chilliwack	50 32 12	123 3	1800	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Port Bous	49 01 18	123 4	1800	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Midway	50 32 11	123 7	1180	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Endicott	50 32 11	123 7	1180	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nicola Lake	49 29 17	123 50	294	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Kootenay	49 21 13	123 17	200	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Garry Point	49 11 15	123 5	180	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tobacco Plains	49 12 13	123 5	180	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vancouver	49 13 12	123 51	330	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Westminster	49 13 12	123 51	330	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a Ladner	49 12 12	123 52	59	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North Nicome	49 12 12	123 52	1700	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chayupat	49 11 15	123 50	40	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clayton	49 11 15	123 50	40	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grainbrook	49 11 15	123 50	40	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Naselle	49 11 15	123 50	40	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bella Coola	49 11 15	123 50	40	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bullion	49 11 15	123 50	40	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bugan S.	49 11 15	123 50	40	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nelson	49 11 15	123 50	40	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Naselle	49 11 15	123 50	40	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Okanagan Mission	49 11 15	123 50	40	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marquis	49 7 12	123 29	16	29 55 30	58 25 93	1 65	19 3	1 3 12 58 0	6 10 0	28 15 2	28 15 2	28 15 2	28 15 2	28 15 2	3	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0</		

ONTARIO:—Con.

Welland	42 59	79 17	722	29 80	30 49	29 25	1 24	22 3	0 9 16	48 0	29	1 0	24 12 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Peterborough	44 17	78 19	722	29 80	30 49	29 25	1 24	17 1	0 3 31	34 0	30	22 5	19 17 3	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Lindsay	44 29	78 45	872	29 80	30 49	29 25	1 24	17 4	2 1 21	41 5	30	22 5	19 16 0	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Deseronto	44 11	77 4	264	29 80	30 49	29 25	1 24	18 5	1 2 29	42 2	29	22 5	19 15 0	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Lakeland	44 25	78 15	...	29 80	30 49	29 25	1 24	21 7	0 0 17	41 0	30	22 5	19 14 7	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Ridgeway	42 30	81 55	...	29 80	30 49	29 25	1 24	21 7	0 0 17	41 0	30	22 5	19 14 7	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Kinston	44 23	76 29	256	29 80	30 49	29 25	1 24	21 7	0 0 17	41 0	30	22 5	19 14 7	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Clinton	44 23	76 29	256	29 80	30 49	29 25	1 24	21 7	0 0 17	41 0	30	22 5	19 14 7	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Ottawa	44 23	76 29	256	29 80	30 49	29 25	1 24	21 7	0 0 17	41 0	30	22 5	19 14 7	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Bisset	46 9	78 6	587	29 80	30 49	29 25	1 24	4 9	1 9 2	40 0	30	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Carrier	46 40	80 50	586	29 80	30 49	29 25	1 24	22 9	—	8 47 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Sarnia	46 40	80 50	586	29 80	30 49	29 25	1 24	22 9	—	8 47 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Stratford	43 23	81 30	1191	29 80	30 49	29 25	1 24	21 2	1 7 36	43 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Lackaw	43 23	81 30	1191	29 80	30 49	29 25	1 24	21 2	1 7 36	43 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
White River	48 35	85 16	1252	29 80	30 49	29 25	1 24	7 0	0 5 11	34 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Port Arthur	48 35	85 16	1252	29 80	30 49	29 25	1 24	7 0	0 5 11	34 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Port Creek	48 35	85 16	1252	29 80	30 49	29 25	1 24	7 0	0 5 11	34 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Stony Creek	43 13	79 45	292	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Oronoke	43 13	79 45	292	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Windsor	42 20	83 4	...	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Alton	43 23	81 30	1191	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Georgetown	43 23	81 30	1191	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
North Bruce	43 23	81 30	1191	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Collingwood	44 25	80 35	1339	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Rocklyn	44 25	80 35	1339	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Whiteside (Bala)	45 0	79 30	...	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Orillia	44 24	79 30	...	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Seaboard	45 0	79 30	...	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Beaufort	45 0	79 30	...	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Coldwater	44 24	79 30	...	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Gravenhurst	44 24	79 30	...	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Haliburton	45 1	78 28	...	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Point Clark	44 5	81 41	595	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Brimm	43 2	81 55	...	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
London	42 59	81 13	808	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Port Stanley	42 40	81 13	808	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Woodstock	42 40	81 13	808	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Port Dover	43 8	80 47	592	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Pelee Island	42 47	80 13	635	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Paris	41 30	82 38	840	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Biscuiting	43 12	80 25	...	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Calvin	46 15	78 45	...	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Acincourt	43 47	79 16	...	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
North Bay	46 31	79 30	303	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Hamilton	43 16	79 51	...	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3
Port Hope	43 56	78 20	...	29 80	30 49	29 25	1 24	24 3	1 0 19	52 0	29	22 5	19 16 2	8 21	4 2 10	8 13	16 20	12 33	9 9	22 4	30 w	3 25	—	0 39	0 40	12 19	0 0	3

**PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c., DURING
JANUARY, 1903.**

STATIONS	RAINFALL					SNOWFALL				Remarks
	Amount in inches	No. of Days 91 or Over.	No. of Fog Days, in Month	Highest Fall in Month	Date.	Amount in inches	No. of Days	Highest Fall in Month	Date.	
BRITISH COLUMBIA	in.			in.		in.		in.		
Sooke Lake,	9.87	16	13	1.60	21	5.5	4	2.5	27	
Royal Oak,	5.14	16	15	1.35	2					
Kuper Island,	4.47	17	12	0.91	2	1.0	2	0.5	16, 27	Fog 6 days; snow drops 22nd.
Caulfields,	6.50	19	11	1.17	2	1.5	2	1.0	27	Fog 8 days.
Goldstream Lake,	7.61	17	8	1.31	20	13.0	6	5.0	30	
Nanaimo,	4.92	11	19	1.50	2	2.0	1	2.0	2	Fog 7 days.
Naas Harbour,	5.41	4	22	2.30	4	21.0	6	10.0	24	
N. W. TERRITORIES—										
Gleichen,						0.8	4	0.5	27	
Weyburn,						7.0	2	4.0	6	
Willow Bunch,						2.8	5	1.5	21	
Victoria,						6.7	3	6.0	24	
Regina,						2.3	3	1.3	31	
Beaver Hills W.,	0.02	1	29	0.02	5	7.0	8	3.0	25	16th—Dense fog.
Bruderheim,						4.0	3	2.0	25	6th—Bad wind storm.
Innisfail,						0.8	4	0.5	21	
Beaver Hills E.,						4.3	4	2.2	25	
MANITOBA—										
Norquay,						5.5	4	3.5	7	
ONTARIO—										
Sunshine,	0.10	3	14	0.06	3	21.9	14	4.0	9	
Princeton,	0.56	3	23	0.38	3	21.0	6	8.0	11	
Goderich,	0.90	3	22	0.40	29	19.5	6	5.0	8	
Dealtown,	0.31	2	10	0.31	2, 3	8.1	8	4.0	11	
Montague,	0.50	2	27	0.31	29	5.0	2	4.0	14	
Ursa,	1.14	5	17	0.48	29	23.0	9	6.0	11	
Providence Bay,	0.86	1	15	0.86	29	44.0	14	6.0	8	
Emisdale,	0.76	2	18	0.49	30	13.5	11	4.0	12	
Wooler,	0.86	2	24	0.43	29	15.5	7	6.0	11	
Jernyn,	0.50	1	28	0.50	29	12.0	2	8.0	11	
Deer Park,	0.55	5	20	0.32	3	15.0	6	5.8	11	
Lion's Head,	1.67	6		0.70	27					
Westport,	0.90	3	15	0.50	29	23.2	13	5.0	11	
Aurora,	0.60	4	14	0.28	3	18.6	11	5.9	7	
Watford,	1.35	2		1.15	3					
Port Burwell,	0.92	4	14	0.50	29	16.0	12	7.0	13	
Warton,	0.74	4	19	0.31	27	39.5	9	18.0	12	
Huntsville,	0.59	1	24	0.50	28	11.5	5	4.0	11	
Ennismore,	1.25	1	24	1.25	29	20.0	6	6.0	11	
Craigleith,	0.45	3	13	0.19	2	32.5	15	4.0	7	
Midland,			29			34.4	14	8.0	9	
Uxbridge,	0.55	5	17	0.32	3	17.0	9	4.0	4	
Georgetown,	0.73	4	5	0.35	3	22.3	22	6.1	11	
Arden,	1.31	5	15	0.47	30	23.0	11	4.0	12	
Croydon,	1.90	3	24	0.85	3	18.0	4	6.0	12	
Orangeville,	1.07	2	16	0.65	3	21.8	14	6.8	12	
Westminster,	0.43	1	22	0.43	2	25.0	8	11.0	11, 12	
Lansdowne,	1.85	1	26	1.85	30	13.0	4	8.0	21	
Scarboro',	0.63	3	14	0.39	3	21.4	11	5.5	11	
Parma,	1.20	3	24	0.53	3	19.0	4	5.0	12	
Wyoming,	0.50	3	23	0.30	3	15.0	5	6.0	11	
Cayuga,	1.16	4	12	0.66	2	5.7	13	3.5	12	
Oliver's Ferry,	0.80	3	25	0.45	29	8.0	3	4.0	21	
Dutton,	R		22	R	3	14.0	8	4.0	11	
NEW BRUNSWICK—										
Poine Escuminac,	0.28	2	25	0.17	30	10.5	4	5.2	17	
NOVA SCOTIA—										
Port Morien,	0.93	5	21	0.47	22	16.0	7	5.0	12	

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE
SUN WAS ABOVE THE HORIZON IN THE MONTH OF JANUARY, 1903.

	HOURS ENDING															
	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.
Victoria				0 00	0 00	0 04	0 08	0 17	0 19	0 19	0 20	0 06				
Nanaimo				0 00	0 03	0 09	0 19	0 19	0 20	0 16	0 11	0 05				
Agassiz				0 00	0 01	0 11	0 26	0 32	0 29	0 32	0 22	0 06				
Battleford				0 12	0 30	0 49	0 52	0 52	0 55	0 41	0 31	0 06				
Indian Head				0 00	0 00	0 01	0 15	0 36	0 51	0 51	0 40	0 19				
Brandon				0 00	0 05	0 25	0 32	0 34	0 46	0 54	0 59	0 27				
Winnipeg																
Woodstock				0 00	0 02	0 09	0 22	0 19	0 20	0 19	0 21	0 15				
Toronto				0 00	0 08	0 22	0 30	0 34	0 38	0 37	0 36	0 22	0 05			
Lindsay				0 00	0 04	0 16	0 28	0 35	0 31	0 27	0 19	0 11	0 05			
Barrie				0 00	0 03	0 09	0 20	0 21	0 21	0 24	0 23	0 15	0 07			
Gravenhurst				0 09	0 09	0 27	0 36	0 34	0 34	0 32	0 26	0 15	0 05			
Kingston				0 09	0 27	0 27	0 30	0 30	0 35	0 14	0 15	0 00				
Ottawa				0 00	0 02	0 11	0 21	0 27	0 38	0 37	0 34	0 14				
Montreal				0 00	0 06	0 25	0 34	0 38	0 43	0 34	0 26	0 08				
Quebec				0 00	0 03	0 29	0 34	0 34	0 40	0 42	0 40	0 13				
Fredericton				0 00	0 13	0 32	0 39	0 52	0 48	0 41	0 36	0 24				

	Victoria.	Nanaimo.	Agassiz.	Battleford.	Indian Head.	Brandon.	Winnipeg.	Woodstock.	Toronto.	Lindsay.	Barrie.	Gravenhurst.	Kingston.	Ottawa.	Montreal.	Quebec.	Fredericton.
Mean proportion for month <i>Constant in kind here.</i>	0 10	0 11	0 18	0 38	0 25	0 33		0 14	0 25	0 19	0 15	0 23	0 22	0 20	0 27	0 26	0 31
Difference from average.	0 10	-	0 00	0 05	0 04	0 08		0 07	0 03	0 07	0 12		0 05	0 12	0 07		0 07
Maximum daily amount	0 58	0 56	0 68	0 93	0 65	0 84		0 84	0 88	0 85	0 77	0 91	0 82	0 79	0 86	0 73	0 82
Days	25	11	15	29	29	30		2	23	18	23	22	18	23	19	23	20
No. of days completely clouded	16	14	18	5	16	7		17	11	13	18	12	13	13	9	11	9

Aurora recorded :—

Where the class of aurora is noted by the observer, it is given (I) being the brightest, (IV) the faintest, and (V) the least brilliancy.

5. Battleford, IV.
24. Stratford, III.
25. Barnardo.
26. Pictou, IV ; Truro, IV ; Gray Hill, Crescent Lake, IV.
27. Melfort.

Thunder recorded on :—

12. Victoria, N.W.T.
17. Ottawa, *hail*.
23. Port Simpson, *hail*.

29. Deseronto, Gravenhurst, Princeton, Montague, Ursa, Providence Bay, Wooler, Arden, Jernyn, Deer Park, Westport, Ennismore, Midland, Unbridge, Georgetown, Croydon, Sunshine, Lansdowne, Parua, Cayuga, Dutton, St. Catharines, North Gower, Belleville, Niagara Falls, Stony Creek, Orillia, Bala, Welland, Peterboro', Otonabee, Hamilton, Haliburton, Port Hope, Kinnmount, Dannville, Calvin, Port Dover, Birnam, Paris, Brantford, Port Stanley, Toronto, Agincourt, Alton.

30. Port Simpson, Sable Island.

FORECASTS FOR JANUARY, 1903.

The forecasts issued by this office at 11 p.m. each night, are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of predictions issued during the month was 1049. These were divided as follows :—

DISTRICT	No. Issued.	VERIFIED			
		No. Fully	No. Partly	No. Not	Percentage
Manitoba	88	74	10	4	80.8
Lake Superior	98	72	20	6	84.7
Lower Lake Region	111	93	13	5	80.6
Georgian Bay	111	90	15	6	87.8
Ottawa Valley	102	83	10	9	80.3
Upper St. Lawrence	102	85	10	7	88.2
Lower St. Lawrence	101	85	8	8	88.1
Gulf	110	91	12	7	88.2
Maritime Provinces, West	113	95	15	3	90.7
Maritime Provinces, East	113	98	11	4	91.6
Total	1049	866	124	59	88.5

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the Agents, et al., observing stations, as well as the telegraphic reports, are used.

R. F. STUPART,

Meteorological Office, Toronto.

D. Pictou

26th February, 1903

DEPARTMENT OF MARINE AND FISHERIES, CANADA.

METEOROLOGICAL SERVICE.



Monthly Weather Review.

VOL. XXVII.

FEBRUARY, 1903.

No. 2.

INTRODUCTION.

In compiling the present *Review* the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the material used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

REMARKS UPON THE WEATHER.

On the islands of British Columbia, fine bright weather prevailed throughout the greater portion of the month, and, although there was precipitation upon several days, more especially from the 7th to 9th, and on or about the 20th and 21st, the total for the month was quite small. On the lower mainland rain occurred from the 7th to 10th, also on or about the 20th, but with these exceptions bright sunshine occurred almost continuously, and by the 28th the ground on the lower levels was practically bare of snow. On the upper mainland the precipitation, which was mostly snow, was recorded chiefly from the 6th to 10th, but it was not general. In some districts bright weather continued throughout the greater portion of the month, and there was no precipitation. Moderate temperatures were general and on Vancouver Island spring flowers were in bloom early in the month.

In the western portion of the North-west Territories, fine bright weather prevailed during the first nine days, after which it became somewhat unsettled and snow occurred frequently at most places during the following seven or eight days. On or about the 18th it became more settled, and although light snow was recorded some days later there was much bright sunshine up to the last day of the month. In northern districts, temperatures below zero occurred almost daily up to the 21st, whilst in the southern portions, the only severely cold weather reported generally, occurred on the first two days, and from the 12th to 16th. In the eastern portion of the Territories somewhat similar conditions prevailed, but the weather was colder, the precipitation was less frequent and at many places not any was recorded.

In Manitoba the most severely cold weather occurred during the first week, also from the 12th to 19th and 28th, and although the temperatures fell to zero or below on many days the intervening periods were comparatively mild. Generally throughout the Province there was much bright sunshine, and the snow which occurred about the 1st, 20th and 27th, was extremely light in the aggregate.

In Ontario the weather was quite mild during the first four or five days, and rain or snow occurred in most districts. Fine, cold weather then intervened, but on the 9th it became milder, and although the nights were cold, the temperature rose each day above the freezing point at most places. These conditions prevailed up to the 12th in the northern, and 13th in the southern portions, rain or snow occurring frequently. On or about the 14th finer and colder weather set in, and after the 16th temperatures below zero were general upon several days. Although it moderated on the 21st, it continued cold until the last three or four days of the month, when mild weather prevailed. From the 14th to 26th the precipitation, which occurred occasionally, was snow; rain was general on the 27th and 28th. In the vicinity of Toronto and westward, there was much bright sunshine, but elsewhere it was deficient. Thunder was general in northern and eastern districts on the 2nd and 3rd.

In the Province of Quebec the weather in the western portion was exceedingly cold from the 6th to 9th, and 13th to 21st, when the temperature at night was well below zero at many places. During the intervening periods it was more moderate, and on or about the 12th, and 26th to 28th, the temperature during the day rose above the freezing point. Much bright sunshine occurred during the second half of the month, but light falls of snow accompanied by strong winds were frequent. In eastern districts, temperatures below zero

occurred almost daily, but at most places mild weather prevailed from the 10th to 12th, and 25th to 28th, rain occurring on the latter date. The depth of snow on the ground on the 28th varied between 20 and 45 inches.

The weather in New Brunswick did not depart much from the normal, it was unusually dull during the first half of the month and snow occurred frequently up to the 13th. Temperature well below zero was recorded on the 7th and 8th, and 18th to 20th, but on or about the 5th, 12th, and 24th to 28th, it was above the freezing point during the day, and on the latter date it exceeded 50° at some places. On the 18th thunder was recorded at Chatham, and on the last day of the month the ground was almost bare in southern districts.

In Nova Scotia the weather was mostly dull and stormy up to the 13th, frequent bright sunshine then occurring and continuing to the 27th. Temperatures below zero were noted at some places between the 18th and 21st, and cold weather prevailed generally during the first four days, and from the 14th to 21st. Throughout the southern portion of the Province the ground was bare on the 28th.

The weather conditions in Prince Edward Island were somewhat similar to conditions in New Brunswick, temperatures below zero occurring on or about the 8th, also from the 18th to 21st. High winds and clouded skies were frequent, and there were frequent falls of snow during the first half of the month, precipitation being also recorded on or about the 18th, 24th and 28th. At Summerside the depth of snow on the 28th was 24 inches, although much that fell during the month was melted on the 12th and 28th, when heavy rain occurred.—F. F. PAYNE.

ATMOSPHERIC PRESSURE.

The mean atmospheric pressure for February was in excess of the normal from Lake Superior to British Columbia, and was deficient over other portions of Canada. The maximum positive departure reported was 0·24 of an inch at Kamloops, B.C., and the minimum negative departure 0·16 of an inch at North Sydney, N.S.

HIGH AREAS.

During February eleven areas of high pressure were sufficiently well marked to be charted. A feature of these areas was the similarity of the course assumed, most of them being first observed while over the north-western portion of the Continent, and finally, after following a south-easterly and easterly course, passing beyond the range of observation between the 35th and 45th parallels of latitude.

Nos. 1, 2 and 10 were moderate areas which formed over the North-west Territories and took a south-east and east course, passing out to sea between the 35th and 45th parallels of latitude. No. 3 moved from British Columbia southward to Mexico between the 5th and 8th. Nos. 4 and 5 formed over the Gulf of Mexico, and moved north-eastward and off the South Atlantic Coast. No. 6 was over Alberta on the 11th and moved south-east and east to the Great Lakes, where, on the 15th, while centred over Ontario, it gradually dispersed. It was accompanied by zero temperatures in Northern Ontario and Quebec on the 14th and 15th. No. 7 moved from Alberta to Dakota between the 11th and 16th. A very severe cold wave developed within this area, a minimum of 44° below zero being reported from Minnedosa, Man., on the 14th. The cold wave spread rapidly eastward, and temperatures below zero were recorded throughout Ontario, Quebec and the Maritime Provinces. No. 8 was a very important area which was over the Territories on the 17th, and took the south-east and east course to the Atlantic, reaching there on the 20th. Like its predecessor, it was accompanied by very low temperatures, and a barometer reading of 30·76 inches was reported from Louisville, Kentucky as the area passed eastward. No. 9 moved from the Middle Plateau Region to the Middle Atlantic States between the 17th and 23rd. No. 11 was over Northern Alberta on the 27th, and travelled southward, being centred over Texas on the morning of March 1st.

LOW AREAS.

Some very pronounced cyclonic areas passed across the Continent, the general movement of the more important being from the south-west towards the Great Lakes, and thence to the New England and Canadian Maritime Coasts. There was very little tendency for cold waves following the passage of these areas, this fact probably bearing some close relation to the uniform and southerly movement of the highs from the west. The more important areas were as follows:—No. 1 was a moderate depression, which, between the 1st and 3rd, passed quickly eastward from the Western States to the Bay of Fundy. No. 2 was a very extended and deep depression which probably formed near the Pacific Coast, whence it passed to the South-west States and then north-east to the Great Lakes and Maritime Provinces. The precipitation which accompanied this area was chiefly snow in Ontario and Quebec on the 3rd and 4th, and rain in the Maritime Provinces on the 4th, and gales occurred in all districts. No. 3 was also first observed near the Pacific Coast, but further south, and a more southerly track was maintained. It was centred in Texas on the morning of the 7th, and then moved to the Great Lakes and Maritime Provinces, in advance of the centre an easterly gale with snow prevailed in Ontario during the night of the 7th and in Quebec the following day, and on the Atlantic Coast there were snow and sleet with moderate gales during the night of the 8th and on the 9th. No. 4—The origin of this

area is doubtful, but it may probably be traced from the West Gulf States to the Great Lakes, where early on the 11th it coalesced with a dispersing area which had moved from the North-west territories. From the Great Lakes the disturbance moved quickly eastward with increasing energy accompanied by rain, and in the Gulf of St. Lawrence and Maritime Provinces there were heavy gales. No. 5 probably had its birth in the extreme South-west States, perhaps near the Pacific Coast, whence it moved to the State near the Gulf of Mexico. From its earlier stages this area had the form of an extended trough with two foci, or it might have been two distinct areas. As it passed eastward south of Nova Scotia on the 17th the barometer was about 28.70. In connection with this area a light snowfall occurred in Southern and Eastern Ontario early on the 16th, and a heavier fall accompanied by east and north-east gales in Quebec and the Maritime Provinces on the 17th. No. 6—A shallow secondary formed over the Great Lakes on the 18th and moved quickly east, following the storm just described. During the week following the 18th several very shallow depressions were observed over different parts of the Continent, but anti-cyclonic conditions were generally prevalent except in the extreme south-west of the Continent, where, by the 24th, there were indications of disturbance. During the 26th there was a rapid development to the west of the Lower Mississippi Valley. By the morning of the 27th an important low was centred in Nebraska, whence it approached the Great Lakes, and on the 28th moved across Canada with increasing energy to the Gulf of St. Lawrence, and in all districts rain was followed by south-west and west gales.

WINDS.

In British Columbia, on Vancouver Island, and over the Lower Mainland, light variable winds prevailed generally, the force of a fresh or strong breeze being seldom attained.

In the North-west Territories the south and west directions predominated. There were eleven days with strong and nine with fresh breezes and two gales.

In Manitoba the direction was likewise largely south and west. The winds blew strong on ten days, fresh on thirteen, and there were three gales.

In the Lake Region the direction slightly favoured the south and west. There were seven days of strong and ten of fresh breezes, and there were seven gales.

In the St. Lawrence Valley the south and west direction predominated. There were five days with strong and eleven with fresh breezes, and there were eight gales.

In the Gulf of St. Lawrence the direction was mainly between the west and north. There were eleven days with strong and seven with fresh breezes, and there were six gales.

In the Maritime Provinces the direction was also chiefly between the west and north. There were seven days with strong and eight with fresh breezes, and there were six gales. The gales occurred on the 1st, a continuance of the gale which was blowing on the last day of January, the 4th, 9th, 12th, 17th and 28th, the heaviest gales being those on the 12th and 28th.

All the gales in the Maritime Provinces were successfully warned at those signal display stations where winter navigation is pursued.

BRIGHT SUNSHINE.

The amount of bright sunshine recorded in February was in excess of the average from British Columbia to Eastern Ontario, and below average in other portions of Canada. The maximum positive departure, 23 per cent, occurred at Agassiz, B.C., and the minimum negative departure, 9 per cent, at Montreal, Que. The mean proportion for the month ranged between 28 per cent at both Gravenhurst, Ont., and Quebec City, and 64 per cent at Battleford, N.W.T.

TEMPERATURE.

The temperature was just about the average over British Columbia and in the extreme eastern portions of the Province of Quebec, and the Maritime Provinces, and elsewhere in the Dominion it was above the average. The positive departure was especially marked in Alberta, both Edmonton and Calgary recording an excess of 9 degrees. It was also well marked in Manitoba with an excess of from 3 to 4 degrees, and over a large portion of Ontario with an excess of from 3 to 5 degrees.

The Highest and Lowest temperatures in each Province during February, 1903, were:

British Columbia,	64.0 on 23rd at Chilliwack.	—21.0 on 5th at Golden.
North-west Territories,	58.0 on 1st at Cardston.	—48.0 on 15th at Duck Lake.
Manitoba,	39.0 on 26th at Treherne.	—44.0 on 16th at Brandon.
Ontario,	52.0 on 25th at Point Clark.	—52.0 on 17th at White River.
Quebec,	54.0 on 28th at Brome.	—39.0 on 18th at Chicoutimi.
New Brunswick,	54.0 on 28th at Moncton.	—31.0 on 18th at Chatham.
Nova Scotia,	54.2 on 28th at Parrsboro.	—16.0 on 20th at Truro.
Prince Edward Island,	45.2 on 28th at Charlottetown.	—10.1 on 18th at Summerside.

PRECIPITATION.

In Ontario the precipitation was above the average east to the boundary of the Province, from an imaginary line drawn north and south from the Georgian Bay district, the excess increasing gradually until one inch and a half was reached on the eastern margin. Throughout Quebec the average was exceeded by from two and a quarter to over three inches. In the Maritime Provinces there was an excess of about an inch in the northern parts, and a deficiency in the extreme south and south-west portions, of from one to nearly two inches. Elsewhere in Canada the average was not maintained, but the negative departure was not marked, except in portions of British Columbia where it was very much so, Barkerville and Victoria recording two and a half inches below the average, and New Westminster close on to six inches below.

DEPTH OF SNOW.

At the close of the month a large amount of snow apparently covered the mountain ranges of the far northern upper mainland of British Columbia. In the northern parts of the Territories and Manitoba, the ground was covered to a depth varying from 10 to 14 inches, diminishing to a very little or none in the southern portions. Along the north shore of Lake Superior and in the Ottawa Valley, the depth was from 24 to 30 inches. In Nipissing and Muskoka from 13 to 24 inches, decreasing to little or none in the southern parts of Ontario. In Quebec the depth varied from 20 inches at Montreal to 45 inches farther east. In the south-western portions of the Maritime Provinces there was none, but elsewhere there was a considerable covering, especially in the northern portions of New Brunswick and Prince Edward Island, where the depth was from 24 to 28 inches.

THICKNESS OF ICE.

NORTH-WEST TERRITORIES AND MANITOBA.—Battleford, 30 inches; Swift Current, 30 inches; Medicine Hat, 26 inches; Minnedosa, 24 inches.

ONTARIO.—Port Arthur, 27 inches; White River, 22 inches; Parry Sound, 14 inches; Southampton, 10 inches; Kingston, 15 inches; Bissett, 14 inches; Welland, 16 inches; Paris, 4 inches; Port Dover, 13 inches; Stony Creek, 10 inches; Georgetown, 16 inches; Orillia, 18 inches; Lansdowne, 9 inches; Stratford, 15 inches.

MARITIME PROVINCES.—Chatham, 22 inches; Charlottetown, 13 inches; Fredericton 21 inches; Yarmouth, 2 inches.

PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, FEBRUARY, 1903.

a. Barometer not reduced to Sea Level. • Stations not furnished with Registering Thermometers.

STATION.	Latitude N.	Longitude W.	Elevation above Sea Level, in feet.	PRESSURE.			TEMPERATURE.				DIRECTION OF WIND FROM				VELOCITY OF WIND			PRECIPITATION.		No. of Foggy days.	No. of Thunderstorms.	No. of Fair days.	No. of Windy days.											
				Mean reduced.	Highest.	Lowest.	Date.	Highest.	Date.	Mean daily range.	Mean temperature of day.	Mean relative humidity.	Cloud amount of days complete.	N.	N. E.	E.	S. E.	S.	S. W.					W.	N. W.	C.	Total number of hours.	Mean miles per hour.	Highest days velocity.	Date and direction from.	Amount.	Difference from Average.	in month.	Harvest fall.
BRITISH COLUMBIA:																																		
Victoria.....	48 24	123 19	85	30.14	30.45	29.136	39.8	0.4	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Back Bay.....	48 22	123 35	4150	30.10	30.40	29.08	38.1	1.6	12 30.0	13.7	0	3	0	0	0	1	17	0	0	0	0	49	56	9.2	9.2	0.46	2.30	0.40	9.15	0	0			
Agassiz.....	49 14	121 31	32	30.10	30.40	29.08	38.1	1.6	12 30.0	13.7	0	3	0	0	0	1	17	0	0	0	0	49	56	9.2	9.2	0.46	2.30	0.40	9.15	0	0			
Port Simpson.....	54 34	130 26	26	30.07	30.32	28.85	37.6	0.5	15 15.1	25.5	0	14	42	3	16	14	4	4	6	1	0	84	0.36	12.9	11 SE	3.75	3.75	0.00	9.15	0	0			
Bamfield.....	51 01	118 6	1476	30.15	30.47	29.16	37.6	0.5	15 15.1	25.5	0	14	42	3	16	14	4	4	6	1	0	84	0.36	12.9	11 SE	3.75	3.75	0.00	9.15	0	0			
Revelstoke.....	50 41	120 29	1193	30.16	30.47	29.16	37.6	0.5	15 15.1	25.5	0	14	42	3	16	14	4	4	6	1	0	84	0.36	12.9	11 SE	3.75	3.75	0.00	9.15	0	0			
Kamloops.....	49 29	120 29	1650	30.16	30.47	29.16	37.6	0.5	15 15.1	25.5	0	14	42	3	16	14	4	4	6	1	0	84	0.36	12.9	11 SE	3.75	3.75	0.00	9.15	0	0			
Princeton.....	49 29	120 29	1650	30.16	30.47	29.16	37.6	0.5	15 15.1	25.5	0	14	42	3	16	14	4	4	6	1	0	84	0.36	12.9	11 SE	3.75	3.75	0.00	9.15	0	0			
Pilot Bay.....	51 38	127 19	29	30.14	30.45	29.136	39.8	0.4	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Stuart Lake.....	51 38	127 19	29	30.14	30.45	29.136	39.8	0.4	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
French Creek.....	50 29	124 36	1246	30.14	30.45	29.136	39.8	0.4	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Coldstream.....	50 14	119 15	1246	30.14	30.45	29.136	39.8	0.4	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Nanaimo.....	49 10	123 37	21	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Port Bells.....	50 22	128 3	37.4	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Midway.....	49 01	118 46	1809	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Endbury.....	50 32	119 7	1190	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Nicola Lake.....	50 32	119 7	1190	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
West Kootenay.....	49 21	123 17	1200	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Garry Point.....	49 11	123 5	2000	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Tobacco Plains.....	49 17	123 5	1965	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Vancouver.....	49 17	123 5	1965	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
New Westminster.....	49 17	123 5	1965	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Ladner.....	49 17	123 5	1965	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
North Nicomen.....	49 12	122 2	590	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Quesselle.....	49 12	122 2	590	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Clayoquot.....	49 11	125 47	40	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Granbrook.....	49 30	115 50	12.8	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Masset.....	53 58	132 9	30	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Pollard.....	52 45	121 55	2775	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Bella Coola.....	52 40	126 54	150	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Duncan's.....	45 45	123 42	40	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Nelson.....	49 29	117 21	21	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Matsqui.....	49 7	122 16	21	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Okanagan Mission.....	49 52	119 29	200	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Alberni.....	49 15	124 49	200	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Saturna Island.....	48 47	123 12	11	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Kaslo.....	49 52	117 0	0	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Cape Scott.....	50 48	128 27	4072	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Glacier.....	51 14	117 29	4072	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Golden.....	51 16	116 55	2550	30.05	30.37	29.13	36.4	0.2	12 23.3	27.2	0	6	334	139	40	49	13	39	27	23	8	672	7.3	2.5	9 SW	1.31	1.31	0.84	9.15	0	0			
Kittiwake.....	50 37	11																																

PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, FEBRUARY, 1903.

n. Barometer not reduced to Sea Level. * Stations not furnished with Registering Thermometers.

STATION.	Latitude N.	Longitude W.	Elevation above Sea Level in feet.	PRESSURE.		TEMPERATURE.				DIRECTION OF WIND FROM.				VELOCITY OF WIND.		PRECIPITATION.				No. of Fogs.																	
				Mean reduced.	Range.	Mean.	Difference from average.	Highest.	Date.	Lowest.	Date.	Mean daily range.	Mean temperature of air.	Mean relative humidity.	No. of days completely clouded.	DIRECTION OF WIND FROM.					Total number of hours.	Mean miles per hour.	Highest days velocity.	Date and direction from.	Amount.	Difference from average.	Heaviest fall in month.	Days rain of or more.	No. of Auroras.	No. of Thunder storms.							
																N.	N.E.	E.	S.E.												S.	S.W.	W.	N.W.	C.		
N.W. 1/2 Sec. 34	40 103 40	102 1	1221	30.15	29.68	30.42	0.74	33.0	26	-12.0	26	15.24	15.24	100	0	0	2	1	0	36	7	17	16	0	84	16.7	20 NW	29 2	27 N	0.25	-0.35	0.24	4.24	0	0	0	
London Heath	40 103 40	102 1	1221	30.15	29.68	30.42	0.74	33.0	26	-12.0	26	15.24	15.24	100	0	0	2	1	0	36	7	17	16	0	84	16.7	20 NW	29 2	27 N	0.25	-0.35	0.24	4.24	0	0	0	
Campanian Manor	40 103 40	102 1	1221	30.15	29.68	30.42	0.74	33.0	26	-12.0	26	15.24	15.24	100	0	0	2	1	0	36	7	17	16	0	84	16.7	20 NW	29 2	27 N	0.25	-0.35	0.24	4.24	0	0	0	
St. Albans (Aweme)	40 103 40	102 1	1221	30.15	29.68	30.42	0.74	33.0	26	-12.0	26	15.24	15.24	100	0	0	2	1	0	36	7	17	16	0	84	16.7	20 NW	29 2	27 N	0.25	-0.35	0.24	4.24	0	0	0	
Port O-borne	40 103 40	102 1	1221	30.15	29.68	30.42	0.74	33.0	26	-12.0	26	15.24	15.24	100	0	0	2	1	0	36	7	17	16	0	84	16.7	20 NW	29 2	27 N	0.25	-0.35	0.24	4.24	0	0	0	
Brandon	40 103 40	102 1	1221	30.15	29.68	30.42	0.74	33.0	26	-12.0	26	15.24	15.24	100	0	0	2	1	0	36	7	17	16	0	84	16.7	20 NW	29 2	27 N	0.25	-0.35	0.24	4.24	0	0	0	
Champlain Island	40 103 40	102 1	1221	30.15	29.68	30.42	0.74	33.0	26	-12.0	26	15.24	15.24	100	0	0	2	1	0	36	7	17	16	0	84	16.7	20 NW	29 2	27 N	0.25	-0.35	0.24	4.24	0	0	0	
Lakelse	40 103 40	102 1	1221	30.15	29.68	30.42	0.74	33.0	26	-12.0	26	15.24	15.24	100	0	0	2	1	0	36	7	17	16	0	84	16.7	20 NW	29 2	27 N	0.25	-0.35	0.24	4.24	0	0	0	
Stony Mountain	40 103 40	102 1	1221	30.15	29.68	30.42	0.74	33.0	26	-12.0	26	15.24	15.24	100	0	0	2	1	0	36	7	17	16	0	84	16.7	20 NW	29 2	27 N	0.25	-0.35	0.24	4.24	0	0	0	
Barren	40 103 40	102 1	1221	30.15	29.68	30.42	0.74	33.0	26	-12.0	26	15.24	15.24	100	0	0	2	1	0	36	7	17	16	0	84	16.7	20 NW	29 2	27 N	0.25	-0.35	0.24	4.24	0	0	0	
Terrebonne	40 103 40	102 1	1221	30.15	29.68	30.42	0.74	33.0	26	-12.0	26	15.24	15.24	100	0	0	2	1	0	36	7	17	16	0	84	16.7	20 NW	29 2	27 N	0.25	-0.35	0.24	4.24	0	0	0	
Hillview	40 103 40	102 1	1221	30.15	29.68	30.42	0.74	33.0	26	-12.0	26	15.24	15.24	100	0	0	2	1	0	36	7	17	16	0	84	16.7	20 NW	29 2	27 N	0.25	-0.35	0.24	4.24	0	0	0	
Almest	40 103 40	102 1	1221	30.15	29.68	30.42	0.74	33.0	26	-12.0	26	15.24	15.24	100	0	0	2	1	0	36	7	17	16	0	84	16.7	20 NW	29 2	27 N	0.25	-0.35	0.24	4.24	0	0	0	
Almest	40 103 40	102 1	1221	30.15	29.68	30.42	0.74	33.0	26	-12.0	26	15.24	15.24	100	0	0	2	1	0	36	7	17	16	0	84	16.7	20 NW	29 2	27 N	0.25	-0.35	0.24	4.24	0	0	0	
Pipestone	40 103 40	102 1	1221	30.15	29.68	30.42	0.74	33.0	26	-12.0	26	15.24	15.24	100	0	0	2	1	0	36	7	17	16	0	84	16.7	20 NW	29 2	27 N	0.25	-0.35	0.24	4.24	0	0	0	
Bowman	40 103 40	102 1	1221	30.15	29.68	30.42	0.74	33.0	26	-12.0	26	15.24	15.24	100	0	0	2	1	0	36	7	17	16	0	84	16.7	20 NW	29 2	27 N	0.25	-0.35	0.24	4.24	0	0	0	
Oakbank	40 103 40	102 1	1221	30.15	29.68	30.42	0.74	33.0	26	-12.0	26	15.24	15.24	100	0	0	2	1	0	36	7	17	16	0	84	16.7	20 NW	29 2	27 N	0.25	-0.35	0.24	4.24	0	0	0	
Portage la Prairie	40 103 40	102 1	1221	30.15	29.68	30.42	0.74	33.0	26	-12.0	26	15.24	15.24	100	0	0	2	1	0	36	7	17	16	0	84	16.7	20 NW	29 2	27 N	0.25	-0.35	0.24	4.24	0	0	0	
Pembina Crossing	40 103 40	102 1	1221	30.15	29.68	30.42	0.74	33.0	26	-12.0	26	15.24	15.24	100	0	0	2	1	0	36	7	17	16	0	84	16.7	20 NW	29 2	27 N	0.25	-0.35	0.24	4.24	0	0	0	
OSTARIO:																																					
Barleybury	47 20 70	90	687	30.03	29.65	29.14	0.45	35.0	26	-13.0	26	17.22	17.22	100	0	7	2	0	0	8	1	11	14	12	56	11	IV	26 W	11	1.09	1.10	1.10	2	0	0	0	
Sudbury	46 25 40	85	840	30.03	29.65	29.14	0.45	35.0	26	-13.0	26	17.22	17.22	100	0	7	2	0	0	8	1	11	14	12	56	11	IV	26 W	11	1.09	1.10	1.10	2	0	0	0	
Swansea	46 25 40	85	840	30.03	29.65	29.14	0.45	35.0	26	-13.0	26	17.22	17.22	100	0	7	2	0	0	8	1	11	14	12	56	11	IV	26 W	11	1.09	1.10	1.10	2	0	0	0	
Schreiber	48 30 57	15	1506	30.03	29.65	29.14	0.45	35.0	26	-13.0	26	17.22	17.22	100	0	7	2	0	0	8	1	11	14	12	56	11	IV	26 W	11	1.09	1.10	1.10	2	0	0	0	
Trusdale	48 30 57	15	1506	30.03	29.65	29.14	0.45	35.0	26	-13.0	26	17.22	17.22	100	0	7	2	0	0	8	1	11	14	12	56	11	IV	26 W	11	1.09	1.10	1.10	2	0	0	0	
Port Arthur	48 30 57	15	1506	30.03	29.65	29.14	0.45	35.0	26	-13.0	26	17.22	17.22	100	0	7	2	0	0	8	1	11	14	12	56	11	IV	26 W	11	1.09	1.10	1.10	2	0	0	0	
Port Arthur	48 30 57	15	1506	30.03	29.65	29.14	0.45	35.0	26	-13.0	26	17.22	17.22	100	0	7	2	0	0	8	1	11	14	12	56	11	IV	26 W	11	1.09	1.10	1.10	2	0	0	0	
Port Arthur	48 30 57	15	1506	30.03	29.65	29.14	0.45	35.0	26	-13.0	26	17.22	17.22	100	0	7	2	0	0	8	1	11	14	12	56	11	IV	26 W	11	1.09	1.10	1.10	2	0	0	0	
Port Arthur	48 30 57	15	1506	30.03	29.65	29.14	0.45	35.0	26	-13.0	26	17.22	17.22	100	0	7	2	0	0	8	1	11	14	12	56	11	IV	26 W	11	1.09	1.10	1.10	2	0	0	0	
Port Arthur	48 30 57	15	1506	30.03	29.65	29.14	0.45	35.0	26	-13.0	26	17.22	17.22	100	0	7	2	0	0	8	1	11	14	12	56	11	IV	26 W	11	1.09	1.10	1.10	2	0	0	0	
Port Arthur	48 30 57	15	1506	30.03	29.65	29.14	0.45	35.0	26	-13.0	26	17.22	17.22	100	0	7	2	0	0	8	1	11	14	12	56	11	IV	26 W	11	1.09	1.10	1.10	2	0	0	0	
Port Arthur	48 30 57	15	1506	30.03	29.65	29.14	0.45	35.0	26	-13.0	26	17.22	17.22	100	0	7	2	0	0	8	1	11	14	12	56	11	IV	26 W	11	1.09	1.10	1.10	2	0	0	0	
Port Arthur	48 30 57	15	1506	30.03	29.65	29.14	0.45	35.0	26	-13.0	26	17.22	17.22	100	0	7	2	0	0	8	1	11	14	12	56	11	IV	26 W	11	1.09	1.10	1.10	2	0	0	0	
Port Arthur	48 30 57	15	1506	30.03	29.65	29.14	0.45	35.0	26	-13.0	26	17.22	17.22	100	0	7	2	0	0	8	1	11	14	12	56	11	IV	26 W	11	1.09	1.10	1.10	2	0	0	0	
Port Arthur	48 30 57	15	1506	30.03	29.65	29.14	0.45	35.0	26	-13.0	26	17.22	17.22	100	0	7	2	0	0	8	1	11	14	12	56	11	IV	26 W	11	1.09	1.10	1.10	2	0	0	0	
Port Arthur	48 30 57	15	1506	30.03	29.65	29.14	0.45	35.0	26	-13.0	26	17.22	17.22	100	0	7	2	0	0	8																	

PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WATHER, &c., DURING
FEBRUARY, 1903.

STATIONS.	RAINFALL.				Date.	SNEEFALE.				Remarks.
	Am- in inches.	No. of Days 30 or Over.	No. of Fair Days.	Heaviest Fall in Month		Amount in inches.	No. of Days.	Heav- est Fall in Month		
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BRITISH COLUMBIA	in.			in.		in.		in.		
Caulfields.	2.51	6	21	1.30	9	0.5	1	0	12	
Royal Oak.	2.87	6	21	1.93	8	0.5	1	0	11	
Goldstream Lake.	1.60	5	19	1.03	9	22.0	6	12.0	9	
Couquitlam.	2.66	3	22	1.77	9	2.5	3	1.0	8	
Naas Harbour.			22			30.0	6	10.0	9	
Port Essington.	1.22	2	19	0.76	26	37.5	7	10.0	11	
Kuper Island.	2.12	9	19	1.50	9					Fog, 24th, 26th.
Nanaimo.	2.51	4	22	1.11	7	3.0	2	2.0	8	
Sooke Lake.	3.70	6	10	2.33	9	4.8	5	1.5	1	
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N. W. TERRITORIES -										
Victoria.						4.0	4	3.0	15	Minimum about 15.
Regina.							1		11	Fog on 12th, 15th, 16th.
Dirt Hills.						2.5	3	1.0	11	
Bruderheim.						5.0	3	4.3	17	
Weyburn.							1		11	
Salcoats.						1.5	2	1.0	11	
Innisfail.						2.5	6	1.0	16	
Gleichen.						2.5	8	1.0	16	25th, prairie bare of snow.
Beaver Hills E.						2.3	4	1.8	17	
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MANITOBA										
Norquay.						4.3	4	2.0	21	
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ONTARIO -										
Goletich.	2.10	4	20	1.00	28	22.0	6	18.0	8	
Ardan.	2.27	5	18	0.75	12	19.0	7	6.0	9	
Westminster.	1.17	4	20	0.68	28	6.0	2	4.0	8	
Searboro'.	1.67	6	15	1.00	28	8.5	9	5.0	8	
Oliver's Ferry.	0.90	3	20	0.60	28	15.0	6	4.0	8	15th, -14.0.
Dutton.	1.40	4	20	0.86	26	6.0	6	3.0	8	
Jernyn.	0.96	2	24	0.46	11	8.0	3	5.0	8	19th, -10.0.
Lansdowne.	0.79	2	23	0.47	11	12.0	3	6.0	8	2nd, thunder storm.
Westport.	1.73	5	18	0.52	4	12.0	5	6.5	8	
Emsdale.	0.71	3	13	0.40	27	22.5	10	8.0	8	
Wyoming.	0.90	2	20	0.70	28	19.6	6	6.0	8	
Parma.	1.08	2	22	0.71	28	14.5	4	7.0	9	
Montague.	1.28	2	21	0.85	28	15.0	5	7.0	8	2nd, thunder; 18th, -14.0.
Port Burwell.	2.30	6	11	1.37	28	10.0	5	3.0	8	1st, dense fog.
Aurora.	0.93	5	17	0.57	28	7.9	8	2.5	5	
Georgetown.	1.38	6	16	0.74	28	12.9	11	6.3	8	Fog, 1st, 2nd, 11th, 27th, 28th.
Uxbridge.	1.09	5	16	0.67	28	12.0	8	3.0	8	17th, -14.0.
Sunshine.	0.33	1	13	0.33	28	28.1	14	6.0	9	
Cayuga.	1.45	4	14	0.50	28	16.0	6	4.0	16	
Princeton.	2.07	5	17	1.34	28	7.0	6	3.0	15	
Lion's Head.	2.17	8	—	0.60	28					
Orangeville.	0.95	2	18	0.95	28	19.9	8	11.8	9	
Dealtown.	2.26	6	17	1.20	28	4.0	5	3.0	15	
Watford.	0.45	2		0.25	28					
Ursa.	2.13	4	16	0.85	11	27.0	8	7.0	8	19th, -25.0.
Croydon.	1.70	4	20	0.70	28	14.0	4	8.0	8	2nd, thunder storm.
Wooler.	1.37	4	21	0.89	28	7.0	3	4.0	8	19th, -12.0.
Midland.						16.3	6	8.0	8	
Warton.	1.34	4	16	0.40	11	22.5	8	8.0	8	2nd, thunder storm.
Deer Park.	1.38	4	22	0.92	28	10.3	3	6.8	8	
Huntsville.	0.50	1	20	0.50	28	23.5	7	11.0	8	
Craigleith.	0.31	3	16	0.17	28	27.5	9	10.0	8	
Providence Bay.	1.49	3	15	1.25	28	35.5	10	16.0	1	
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NEW BRUNSWICK -										
Poinc Escummac.	0.64	4	10	0.46	28	32.3	6	11.5	9	
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NOVA SCOTIA -										
Port Morien.	1.05	3	22	0.49	27	9.0	1	4.0	4	

Aurora recorded —

Where the class of aurora is noted by the observer, it is given (I) being the brightest, (IV) the feeblest in brilliancy.

21. Qu'Appelle, IV.

22. Haileybury, III.

24. Hillview, III; Threehills Creek, III; Gray Hill, Swift Current, IV; Melfort, IV.

25. Haileybury, III; Victoria, III.

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE
SUN WAS ABOVE THE HORIZON IN THE MONTH OF FEBRUARY, 1903.

	Hours Ending															
	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.
Victoria				0 02	0 20	0 38	0 44	0 48	0 50	0 61	0 58	0 46	0 10	0 03		
Nanaimo				0 05	0 23	0 25	0 34	0 38	0 54	0 57	0 53	0 47	0 14			
Agassiz				0 02	0 24	0 44	0 53	0 59	0 65	0 65	0 57	0 51	0 16			
Battleford			0 15	0 61	0 68	0 76	0 79	0 75	0 75	0 69	0 68	0 49	0 11			
Indian Head			0 00	0 00	0 00	0 13	0 48	0 52	0 68	0 75	0 78	0 76	0 35			
Brandon			0 00	0 00	0 11	0 61	0 74	0 77	0 80	0 81	0 82	0 72	0 15			
Winnipeg			0 03	0 35	0 64	0 80	0 79	0 72	0 61	0 76	0 45	0 03				
Woodstock			0 03	0 24	0 39	0 53	0 46	0 46	0 48	0 40	0 28	0 04				
Toronto			0 01	0 25	0 40	0 49	0 48	0 54	0 49	0 47	0 45	0 26	0 01			
Lindsay			0 11	0 29	0 41	0 44	0 38	0 39	0 39	0 38	0 25	0 25	0 16			
Barrie																
Gravenhurst				0 08	0 12	0 40	0 39	0 35	0 32	0 25	0 26	0 26	0 18	0 01		
Kingston				0 10	0 30	0 40	0 38	0 40	0 41	0 41	0 38	0 29	0 03			
Ottawa				0 03	0 28	0 30	0 46	0 52	0 47	0 50	0 46	0 33	0 01			
Montreal				0 03	0 20	0 31	0 39	0 46	0 45	0 42	0 37	0 24	0 01			
Quebec				0 04	0 31	0 42	0 40	0 39	0 31	0 35	0 37	0 22	0 02			
Fredericton				0 05	0 33	0 49	0 52	0 52	0 58	0 53	0 45	0 40	0 69			
Mean proportion for month (O'Connell's mean being 1)	0 37	0 34	0 43	0 64	0 44	0 56	0 54	0 33	0 39	0 35	0 28	0 31	0 34	0 33	0 28	0 39
Difference from average	0 13		0 23	0 19	0 11	0 10	0 05	0 02	0 02	0 02		0 07	0 01	0 09		0 04
Maximum daily amount	0 88	0 98	0 80	0 92	0 68	0 75	0 77	0 90	0 80	0 94	0 88	0 81	0 80	0 91	0 83	0 81
Date	27	27	23	24	20	16	24	27	14	25	17	25	7	19	19	20
No. of days completely clouded	2	6	6	1	0	2	2	9	8	10	15	8	9	41	12	8

FORECASTS FOR FEBRUARY, 1903.

The forecasts issued by the office at 11 p.m. each night, are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of predictions issued during the month was 944. These were divided as follows:—

DISTRICT.	No. Issued.	VERIFIED.			Percentage
		No. Fully.	No. Partly.	No. Not.	
Manitoba	77	63	12	2	89.6
Lake Superior	78	72	4	2	94.9
Lower Lake Region	100	85	11	4	90.5
Georgian Bay	100	79	15	6	86.5
Ottawa Valley	95	84	9	2	93.2
Upper St. Lawrence	95	86	8	1	94.7
Lower St. Lawrence	98	83	14	1	91.8
Gulf	97	76	16	5	86.6
Maritime Provinces, West	102	82	13	7	86.8
Maritime Provinces, East	102	79	15	8	84.8
Total	944	789	117	38	89.7

FORECASTS ISSUED AT VICTORIA, BRITISH COLUMBIA.

DISTRICTS.	No. Issued.	VERIFIED.			Percentage.
		No. Fully.	No. Partly.	No. Not.	
Victoria and vicinity	117	86	7	24	76.5
Lower Mainland	108	68	17	23	70.8
Total	225	154	24	47	73.8

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. E. STUPART,

Director.

Meteorological Office, Toronto.

27th March, 1903.

DEPARTMENT OF MARINE AND FISHERIES, CANADA
METEOROLOGICAL SERVICE.



Monthly Weather Review.

VOL. XXVII.

MARCH, 1903.

No. 3.

INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the material used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

REMARKS UPON THE WEATHER.

On the Islands of British Columbia the weather was quite cold during the first half of the month, and although it improved somewhat after the 15th the nights were cold and hard frost occurred frequently up to the 25th. From the 1st to 5th and 15th to 24th there was much bright sunshine, rain or snow being recorded occasionally during the intervening periods. Over the Lower Mainland cool weather also prevailed and there was little improvement until after the 21st. Rain occurred frequently from the 6th to 12th and 26th to 31st, and bright sunshine was almost continuous from the 1st to 5th and 13th to 25th. Over the Upper Mainland the weather conditions were somewhat similar to conditions further westward but the cold was even more intense and there was more bright sunshine.

The weather was extremely cold in the North-west Territories, the temperature falling well below zero in many districts almost daily. On or about the 6th, 15th to 17th, and 22nd to 31st somewhat milder conditions prevailed and throughout the month there was much bright sunshine and comparatively little precipitation. By the 31st most of the snow on the prairies disappeared and the ground in many places was practically bare. A few migratory birds arrived late in the month.

In Manitoba much milder weather than in the Territories was almost general, more especially at night, when the temperatures were much higher. The sky was also much more frequently clouded, which undoubtedly arrested radiation and was the cause of the milder nights. Snow occurred occasionally but the total fall was not large and by the 30th sleighing was over. Wild geese were observed on the 31st.

The weather in Ontario was moderately cold on the 1st and then turning exceedingly mild it continued so to the end of the month, the daily maximum temperatures generally exceeding 40° and rising to between 60° and 70° upon several occasions from the 17th to 20th. Hard frost occurred occasionally at night but altogether the weather was phenomenally mild. Clouded skies were unusually frequent, and the precipitation, which was chiefly rain, was also frequent from the 1st to 10th, and 16th to 23rd in southern counties, and from the 1st to 17th and 18th to 27th in northern districts. Lakes and rivers were open and there were many other signs of spring at an early date.

In the province of Quebec the weather was cold during the first two or three days, after which it turned exceedingly mild and continued so to the end of the month. Rain in place of snow, and much cloudiness were also exceptional. In the western portion of the Province the ground was almost bare shortly after the middle of the month, but in eastern districts there was still much fast melting snow on the 31st. As in Ontario, rivers and lakes opened unusually early.

The unusually early spring like conditions which prevailed in Ontario and Quebec were also characteristic of the weather in New Brunswick; and, although somewhat less marked, the temperature was unusually high after the 3rd, and there was more bright sunshine than in the former Provinces. The precipitation, which was mostly rain, was recorded chiefly between the 5th and 12th and 17th and 25th, also on the 31st. In the southern portion of the Province the ground was bare on the 31st in the open country and many rivers were also open by this date.

In Nova Scotia extremely mild weather prevailed on the 1st and 2nd, also after the 4th to the end of the month: light winds and clouded skies were also unusually frequent in most districts. Much rain occurred along the Atlantic Coast, whilst at some places elsewhere it was somewhat deficient. Falls of snow were recorded in northern districts on or about the 6th and 29th, but with these exceptions the precipitation was chiefly rain. The harbours and bays were free of ice by the 31st and there were many signs of spring after the 20th.

The weather in Prince Edward Island was unusually mild after the 4th and continued so to the 31st. The sky was frequently overcast and precipitation was also quite frequent, more especially from the 18th to 29th. Spring-like conditions prevailed at an exceptionally early date, the ground being quite bare and navigation being open on the 31st. F. F. PAYNE.

ATMOSPHERIC PRESSURE.

The mean atmospheric pressure for March was subnormal in British Columbia, but exceeded the average over all the other portions of Canada. The excess was exceptionally large in the Maritime Provinces, where at Sydney, N.S., the positive departure, 0.37 of an inch occurred. Barkerville, B.C., recorded the minimum negative departure, 0.09 of an inch.

HIGH AREAS.

Eleven areas of high pressure were traced, and they were nearly all of much importance. The cold weather, which usually accompanied them in the west, did not, however, affect the Continent to any marked extent east of the Lakes and the Mississippi Valley.

No. 1 was centred over Texas on the morning of the 1st, whence it moved to Virginia on the 2nd and dispersed. While No. 1 was dispersing, No. 2, which appeared on the morning of the 2nd over Lake Superior, was developing into an important area, which travelled over Maine on the 3rd with the barometer reading as high as 30.76 inches, and passed off the Nova Scotian Coast on the 4th. This area was accompanied by cold weather, but the Lake Region was not much affected by it. No. 3 appeared over Northern British Columbia on the 1st, and moving slowly south-eastward, reached Wisconsin on the 5th. It then moved due east and off the Nova Scotian Coast on the 7th. It was attended by zero temperatures in the Territories on the 3rd, 4th and 5th, and by moderately cold weather on the 6th and 7th in the Ottawa and St. Lawrence Valleys. No. 4 moved into California from the Pacific on the 6th, thence rapidly across the Continent, passing into the Gulf of St. Lawrence on the 9th. No marked change in temperature accompanied this area. No. 5 was centred on the 9th in Alberta, and moved with varying energy and with an irregular course through the North-west States and Territories until the 11th, when it was absorbed into No. 6 over the Missouri Valley. Low temperatures occurred in the Territories on the 9th and 10th, and in Manitoba on the 10th. Area No. 6 had appeared over California on the 9th, and followed the 40° parallel of latitude until the 11th, when the combined system moved into the Lake Region, and then south-east to disperse over the Middle Atlantic States. No. 7 hovered in the Territories from the 10th until the 13th, when it moved rapidly eastward, passing off our Atlantic Coast on the 16th. Low temperatures accompanied this area from the 10th to 14th in the Territories, and on the 13th, 14th and 15th in Manitoba, but there were no very marked temperature changes east of Lake Superior. No. 8 was centred over Assiniboia on the 16th, whence it moved steadily eastward across Canada to the Gaspé Peninsula, thence on the 18th southward, and eventually dispersed off the Virginia Coast on the 20th. Some low temperatures attended this area on the 15th and 16th in the Territories. No. 9, after hovering in the Territories from the 17th to the 20th, moved south to Wyoming, thence over the Ohio Valley and into the Lake Region, where it was centred on the 22nd, and on the 23rd it passed off the Atlantic Coast. Some low temperatures were recorded in the Territories on the 18th, 19th and 20th. No. 10 appeared in Idaho on the 22nd, and after travelling south-eastward over the Continent, it passed off the Carolina Coast on the 27th. No. 11 was situated in Alberta on the 24th, and after a somewhat sluggish movement over Canada it reached the coast of Maine on the 30th. When over the Ottawa Valley and its environs the most marked fall in temperature of the month occurred in the Lower Lake Region.

LOW AREAS.

Twelve areas of low pressure were traced during the month, but they were with few exceptions of remarkably feeble energy. Their paths were also very erratic. The larger number of the areas first appeared either in the far North-west or else on the Pacific Coast. Nos. 9 and 10 were the two most pronounced depressions. No. 9 was situated over New Mexico and its environs on the 22nd. It moved quickly to the Ohio Valley, where, on the 23rd, it separated into two parts, one to move to the Upper St. Lawrence Valley and disperse, the other to Lake Michigan and develop, assuming for a short period very energetic conditions. After the morning of the 24th it, however, diminished, and passed north of the Ottawa Valley and into the Gulf of St. Lawrence. The system gave rain generally from Ontario to the Maritime Provinces, the quantity being

excessive in the latter Provinces; the winds at the same time were strong to moderate gale mainly in the Lake Region and the St. Lawrence Valley. No. 10 apparently passed slowly across the Gulf of Mexico between the 26th and 29th, thence up the United States Atlantic Coast, and on the 31st across the Maritime Provinces. In Canada it was chiefly noticeable for the heavy rains which it brought to Nova Scotia and New Brunswick.

WINDS.

In Vancouver Island and over the mainland of British Columbia the direction was largely variable. On one occasion the winds increased to a moderate gale, and there were fifteen days on which the force of either a fresh or strong breeze was attained.

In the North-west Territories the direction favoured somewhat the north and west. No general gale was experienced, but there were fifteen days with strong, and fourteen with fresh winds.

In Manitoba the direction was largely westerly to northerly. The winds were strong on fourteen days, fresh on nine; there were no general gales.

In the Lake Region no one direction was paramount. The wind mileage was very moderate. On five days a strong and on eleven a fresh breeze prevailed, and on two occasions there was a moderate gale of short duration.

In the Ottawa and St. Lawrence Valleys the direction was for the most part variable. Strong breezes were experienced on eleven and fresh on fourteen days, and there were two moderate gales.

In the Lower St. Lawrence Valley and the Gulf the direction was likewise chiefly variable. On fifteen days the winds were strong, on fourteen fresh, and one moderate gale was recorded.

In the Maritime Provinces no particular direction was much in evidence. On ten days the winds were strong, on eleven fresh, and on the 23rd one or two places in the Bay of Fundy recorded the force of a moderate gale.

BRIGHT SUNSHINE.

The amount of bright sunshine recorded was above average in British Columbia and the North-west Territories, and below average from Manitoba to the Maritime Provinces. The largest positive departure, 0.08 was registered both at Battleford and Indian Head, N.W.T., and Winnipeg, Man., recorded the largest negative departure, 0.22. The greatest proportion of the month, 0.55 was reported from Battleford, N.W.T., and the least, 0.24 from Lindsay, Ont.

TEMPERATURE.

The temperature was below the average from the western boundaries of Manitoba to Vancouver Island, the greatest negative departures amounting to from 9 to 12 degrees occurring in Southern Alberta. From Manitoba to the Atlantic Coast the average was everywhere exceeded, the positive departures increasing eastward to as much as 9 and 12 degrees in the Georgian Bay District and the Ottawa Valley, and then gradually diminishing again until 3° was reached in the Gulf of St. Lawrence.

The Highest and Lowest temperatures in each Province during March, 1903, were:

British Columbia,	69° 1 on 26th at Chilliwack.	—23° 5 on 14th at Golden.
North-west Territories,	62° 0 on 28th at Bidsbury.	—39° 8 on 13th at Kneehill.
Manitoba,	50° 0 on 29th at Bowsman.	—27° 0 on 19th at Bowsman.
Ontario,	77° 0 on 19th at Cottam.	—36° 0 on 2nd at White River.
Quebec,	65° 5 on 20th at Richmond.	—27° 3 on 3rd at Chicoutimi.
New Brunswick,	62° 2 on 14th at St. Stephen.	—6° 0 on 2nd at Bathurst.
Nova Scotia,	60° 0 on 13th at Halifax.	—1° 5 on 3rd at Parrsboro.
Prince Edward Island,	48° 0 on 1st at Charlottetown.	—0° 4 on 3rd at Summerside.

PRECIPITATION, DEPTH OF SNOW AND THICKNESS OF ICE.

The total precipitation of the month was less than average over the larger part of British Columbia, and even on the coast a portion of it was snow. In the North-west Territories and Manitoba, where it was almost wholly snow, there were no pronounced differences from average. In Ontario there was practically no snow except along the north shore of Lake Superior, and the rainfall was in most localities a little short of the average, especially in the more central counties. In Quebec there was little or no snow, and the rainfall, which was just average at Montreal, was somewhat above average further east. Over the larger part of the Maritime Provinces the precipitation was considerably in excess of the average, and in northern districts was partly snow, while further south it was almost wholly rain. From a very limited number of reports it would appear that there was less snow on the ground in the northern portions of Cariboo than is usual at this date. There was still a considerable covering in Northern Alberta and in Saskatchewan, and the prairies of Southern Alberta

and Assiniboia were entirely bare, and even in Manitoba was only during the last few days of the month that the sleighing was barred. In Ontario except in the extreme east and north, the ground was bare early in the month. In Quebec there was still snow on the ground from Quebec City eastward, and considerable snow lay in the woods of Northern New Brunswick.

The snows of ice is reported as follows:—Battleford, 30 inches; Minnellsa, 22 inches; Port Arthur, 20 inches; White River, 12 inches; Parry Sound, 3½ inches; Chatham, N. B., 1½ inches.

MARCH WINDS

As the impression appears to be somewhat general in Canada that March is a month of excessive wind mileage and at the same time of very cold winds, a review of what has actually occurred during the past thirty years in regard to these matters in Ontario, Quebec and the Maritime Provinces will perhaps be of some interest. Thirty years may not be a very long period but probably of sufficient length to give an approximation of the prevailing characteristics of the month.

From March, 1874 to 1903, both inclusive, we find that the number of gales occurring in Ontario were 48 less than in the corresponding series for December, 68 less than in January and 25 less than in February. In the Province of Quebec the numbers for the same period were 48, 56 and 28, and in the Maritime Provinces 57, 66 and 27.

As gales as a rule continue for at least one and not infrequently for two or more days, the large diminution of the number of gales in March must necessarily mean a considerable decrease in the number of days of high winds compared with the number of days of high winds occurring during the three preceding months. It might here be noted that the much smaller number of gales in February than in January is in part accounted for by the lesser number of days in February, taken of course in conjunction with the gradual decrease of stormy weather as the season advances towards spring. It may be suggested that when a high wind sets in in March it is likely to continue longer than at other seasons of the year, but there is nothing in the general movements of high and low pressure areas to warrant such a supposition. As to the winds being of excessive coldness, temperature records for a long series of years prove March in Ontario to be from six to ten degrees higher on the average than in February, in Quebec to be nine degrees higher, and in the Maritime Provinces seven degrees higher. Such a large difference in the average mean temperature between the two months must give fewer cold winds in March than in February. We also find on comparing records again that the snowfall of March is very much less than during the preceding winter months.

We are all familiar with the old saw, "If March comes in like a lion, it goes out like a lamb" or vice versa. This saying apparently has been somewhat perverted for a reference to an old book styled "Weather Folklore" quotes the following: "March comes in like a lion and goes out like a lamb." "March comes in with an adder's head but goes out like a peacock's tail". Turning again to the records of the past thirty years, we see that in Ontario March went out rough on nineteen years, in Quebec on eighteen, and in the Maritime Provinces on seventeen years, consequently March appears to be more likely to go out like a lion than a lamb. As to the idea, if March comes in rough it will go out quietly, or vice versa, there is nothing in the records to justify this assumption, for during the past thirty years these conditions were maintained in twelve years only, in Ontario and Quebec, and in eleven in the Maritime Provinces. With such a long series of records opposed to the generally conceived notions of the dreaded conditions to be anticipated in March it must be allowed that the marked supposed eccentricities of the weather of the month are largely illusory.

Many of the old sayings and proverbs regarding the weather and its changes have been handed down in Canada from generation to generation of descendants chiefly from the British Isles, and these legends if applicable to the weather conditions of those islands, which is very doubtful, are certainly not adaptable to a continental climate such as we enjoy.

Ontario, Quebec and the Maritime Provinces only have been treated of in this paper because similar records of the winds, etc., are not available for the remaining parts of Canada; however there can be no apparent reason why the same sequence of changes experienced over the districts reviewed should not occur elsewhere in the Dominion and in fact throughout the northern hemisphere generally: i.e. a marked decrease in stormy weather as the season advances towards the spring and summer. B. C. WEBBER.

TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, MARCH, 1903.

a Barometer not reduced to Sea Level. * Stations not furnished with Registering Thermometers.

STATION	Latitude N	Longitude W	Elev. above sea level in feet	Pressure			Temperature			Mean monthly range	Mean temperature of month	Mean relative humidity	No. of days completely clouded	Direction of wind from						Velocity of wind			Precipitation			No. of days with rain or more	No. of hurricanes	No. of foggy days																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
				Mean reduced	Highest	Lowest	Range	Mean	Difference from average					Highest	Lowest	Date	Mean daily	No. of days completely clouded	N	N.E.	E.	S.E.	S.	W.	W.				N.W.	C.	Total number of hours	Mean miles per hour	Highest day's velocity	Date and direction	Amount	Difference from average	Highest fall in month	Days with 10 or more in month																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, MARCH, 1903.

a. Barometer not reduced to Sea Level. * Stations not furnished with Registering Thermometers.

STATION	Latitude N	Longitude W	Elevation above sea level, in feet.	PRESSURE			TEMPERATURE				DIRECTION OF WIND FROM								VELOCITY OF WIND			PRECIPITATION				No. of days with rain or more.	No. of days with snow or more.	No. of days with fog or more.	No. of days with storm or more.											
				Mean reduced.	Highest.	Lowest.	Range.	Mean.	Difference from average.	Years observed.	Highest.	Date.	Lowest.	Date.	Mean daily range.	Mean temperature of day.	Mean relative humidity.	Mean amount of cloud.	No. of days completely clouded.	N.	N.E.	E.	S.E.	S.W.	W.					N.W.	C.	Total number of hours.	Mean miles per hour.	Highest days.	Date and direction.	Amount.	Difference from average.	Heaviest fall in month.	Days with 91 or more.	
Quebec	46 51	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	46 51	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Boston	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.3	1.3	81	81	0	0	0	0
Cap de Chate	42 22	71 03	120	30.12	30.87	30.33	0.54	30.57	0.24	19	30.87	1903	30.33	1903	0.54	30.57	71	71	71	11	20	33	9	2	57	61	13	19	36	71	6.1	36	1.							

**PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c., DURING
MARCH, 1903.**

RAINFALL.					SNOW-FALL.					REMARKS.
STATIONS.	Amount in inches.	No. of Days of Rain or Over.	No. of Days of Fall.	Heavyest Fall in Month Date.	Amount in inches.	No. of Days in Month.	Heavyest Fall in Month Date.			
BRITISH COLUMBIA.										
Nas Harbour	1.72	2	27	1.20	19	1.0	1	1.0	6	
Fort Essington	3.40	6	24	1.50	20	4.0	1	4.0	6	
Kuper Island	2.06	9	18	0.74	28	18.6	4	10.0	10	
Coalfields	3.05	10	20	0.45	27	14.5	3	5.0	12	
Nanaimo City	2.71	9	22	1.54	27	7.0	2	7.0	10	
Royal Oak	1.87	8	21	0.64	8	12.5	3	6.0	10	
Goldstream Lake	2.04	8	18	0.88	28	56.5	7	25.0	10	
Sooke Lake	2.23	8	20	0.63	28	24.5	1	16.0	10	
Coupland	4.81	7	23	1.27	27	7.0	2	3.3	10	28th, thunder.
N. W. TERRITORIES—										
Regina	R		21	R	31	1.9	6	1.0	3	
Dut Hills			27			4.5	4	3.0	2	
Innisfail	0.01	1	24	0.01	31	6.0	8	3.0	11	
Gleichen			25			2.8	6	1.0	11	
Weyburn	1.00	1	23	1.00	28	11.0	6	4.0	17	
Bruderheim			23			5.2	8	2.0	10	
Victoria			26			1.3	5	0.5	8	
Beaver Hills E.			24			11.5	7	6.0	11 12	
Beaver Hills W.			23			8.9	8	4.5	10 11	
Saltearts			20			3.5	2	3.0	6	
MANITOBA—										
Norquay	0.46	2	24	0.12	10	6.5	5	3.0	22	
Gretna	0.50	1	18	0.50	20	13.2	11	6.0	22	
Belmont	0.09	2	24	0.06	20		5			
Morden			24			4.0	7	4.0	17	
Rathwell	R		24	R	15	3.6	6	1.8	22	
Rapid City			30			1.0	1	1.0	21	
Moreton	0.05	2	22	0.04	31	6.0	6	2.0	17	
ONTARIO—										
Goderich	0.80	2	20	0.50	7	1.0	1	1.0	20	
Smith's Falls	1.37	8	21	0.57	24	2.0	1	2.0	4	
Croydon	3.05	6	25	0.90	9					
Warton	2.09	7	23	0.96	18	1.0	1	1.0	24	20th, thunder.
Aurora	1.18	7	23	0.36	20	0.8	1	0.8	4	20th, thunder.
Port Burwell	2.80	11	18	0.76	7	1.0	2	0.5	28	20th, thunder.
Ardan	2.37	11	19	0.62	24	3.0	2	2.0	5	20th, thunder.
Watford	1.45	5		0.60	7					
Parma	2.27	6	23	0.54	17	2.5	2	1.5	3	8th, thunder.
Jernyn	1.60	5	26	0.48	23					21st, thunder.
Midland	0.47	5	24	0.18	20		2			18th, 19th, 20th, thunder.
Ensdale	1.32	7	20	0.50	7	4.5	6	3.0	2	18th, 19th, 20th, thunder.
Georgetown	1.44	11	14	0.34	20	1.8	6	0.9	5	18th, 19th, 20th, thunder.
Huntsville	2.74	6	23	1.75	18	5.0	3	2.5	2	18th, 19th, thunder.
Orangeville	1.68	6	22	0.55	8	1.0	3	0.6	5	
Scarboro'	1.67	8	18	0.42	20		6			20th, thunder.
Lion's Head	1.92	10		0.55	7					18th 21st, thunder.
Cridgleith	0.77	6	23	1.03	7	1.0	2	0.5	4	
Wooler	1.93	8	21	0.60	23					7th, thunder.
Montague	1.57	5	24	0.55	23					
Lausdowne	0.77	3	26	0.43	11	1.0	2	1.0	2	
Uxbridge	1.55	7	23	0.36	20	1.5	2	1.5	6	
Ursu	1.70	10	18	0.60	7	4.0	3	2.0	24	18th, 20th, thunder.
Westport	1.73	7	23	0.80	23	0.1	1	0.1	2	
Dutton	1.25	7	21	0.25	8					
Dealtown	1.94	8	22	0.41	8					20th, thunder.
Westminster	1.73	7	22	0.73	7					20th, thunder.
Cayuga	3.38	11	19	0.65	14					
Ennismore	0.84	2								
Sunshine	0.72	5	25	0.35	11	2.0	2	1.5	24	
Deer Park	1.67	7	23	0.46	8					20th, thunder.
Wyoming	1.87	6	24	0.70	8	1.0	1	1.0	1	20th, thunder.
Pinetown	2.48	9	21	0.84	7	1.5	2	1.0	5	
Oliver's Ferry	1.19	8	22	0.32	23	1.5	1	1.5	5	
Providence Bay	2.50	6	24	0.55	19	2.5	2	1.5	27	19th, terrible thunder.
NEW BRUNSWICK—										
Pont-Escummae	1.22	6	23	0.52	21	5.2	2	3.1	6	
NOVA SCOTIA—										
Port Morien	1.14	5	23	0.48	23	3.5	3	2.0	6	

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE
SUN WAS ABOVE THE HORIZON IN THE MONTH OF MARCH, 1903.

	HOURS ENDING.															
	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.
Victoria			0 00	0 17	0 46	0 57	0 57	0 56	0 55	0 61	0 62	0 53	0 37	0 09		
Nanaimo			0 03	0 40	0 54	0 53	0 58	0 55	0 55	0 53	0 53	0 53	0 45	0 10		
Agassiz			0 00	0 06	0 34	0 49	0 53	0 56	0 58	0 58	0 58	0 58	0 45	0 09		
Battleford	0 25	0 61	0 70	0 65	0 63	0 62	0 64	0 63	0 57	0 57	0 54	0 43	0 09			
Indian Head			0 00	0 01	0 17	0 45	0 59	0 66	0 68	0 68	0 65	0 62	0 36	0 04		
Brandon			0 00	0 04	0 29	0 44	0 62	0 68	0 70	0 67	0 61	0 51	0 37	0 02		
Winnipeg			0 00	0 21	0 32	0 40	0 38	0 43	0 43	0 48	0 39	0 20	0 01	0 00		
Woodstock			0 06	0 10	0 29	0 35	0 38	0 36	0 44	0 40	0 39	0 34	0 19	0 00		
Toronto			0 00	0 15	0 31	0 36	0 41	0 46	0 44	0 39	0 36	0 33	0 24	0 09		
Lindsay			0 03	0 09	0 25	0 35	0 32	0 32	0 34	0 30	0 31	0 19	0 16	0 15	0 04	
Barrie			0 02	0 21	0 27	0 34	0 37	0 45	0 44	0 42	0 36	0 28	0 24	0 05		
Gravenhurst			0 06	0 31	0 34	0 35	0 40	0 46	0 44	0 46	0 46	0 38	0 31	0 06		
Kingston			0 14	0 28	0 35	0 43	0 44	0 42	0 32	0 28	0 25	0 15	0 01	0 00		
Ottawa			8	0 17	0 36	0 41	0 47	0 48	0 52	0 48	0 49	0 39	0 15	8		
Montreal			0 01	0 26	0 34	0 38	0 41	0 40	0 40	0 40	0 46	0 41	0 14	0 00		
Quebec			0 01	0 14	0 25	0 30	0 33	0 40	0 44	0 50	0 48	0 36	0 19	0 01		
Fredericton			0 02	0 26	0 33	0 36	0 36	0 41	0 48	0 49	0 49	0 45	0 44	0 37	0 02	
Mean proportion for month (Constant sunshine being 1.0)	0 43	0 45	0 35	0 55	0 41	0 41	0 28	0 27	0 30	0 24	0 29	0 34	0 26	0 33	0 34	0 29
Difference from average	0 06		0 11	0 08	0 08	0 02	0 22	0 06	0 12	0 15	0 09	—	0 16	0 04	0 11	0 06
Maximum daily amount	0 84	0 88	0 81	0 99	0 73	0 74	0 81	0 78	0 86	0 94	0 83	0 86	0 82	0 81	0 87	0 70
Date	19	19	3	13	13	27	5	29	29	29	29	29	29	29	1	18
No. of days completely clouded	7	5	7	4	4	4	9	15	10	11	7	9	9	7	8	10

Aurora recorded :—

Where the class of aurora is noted by the observer, it is given, (I) being the brightest, (IV) the feeblest in brilliancy.

3. Moosejaw.
18. Uplands.
19. Uplands.
20. Abitibi, Uplands.
25. Sturgeon Falls.
28. Haileybury, IV ; Clayoquot.
29. Haileybury, IV.
31. Victoria, Alta, III.

Thunder recorded on : —

17. Beatrice.
18. Meaford, Point Clark, Haliburton, Bruce Mines, Bala, Rocklyn, Owen Sound, Emsdale, Huntsville, Lion's Head, Ursa, Gravenhurst, St. Agathe, Parry Sound, Haileybury.
19. Point Clark, Haliburton, Bruce Mines, Bala, Stony Creek, Wiarton, Emsdale, Georgetown, Huntsville, Providence Bay, Gravenhurst, Sturgeon Falls, St. Agathe, Parry Sound, Haileybury.
20. Hamilton, Port Dover, Meaford, Kinmount, Point Clark, Beatrice, Birnam, Agincourt, Bruce Mines, Dunnville, Rocklyn, Welland, Peterboro, Ridgetown, Erasmus, Brantford, Owen Sound, Aurora, Port Burwell, Midland, Emsdale, Georgetown, Gravenhurst, Sturgeon Falls, Stratford, London, Bissett, Port Stanley, Huntsville, Scarboro, Ursa, Dealtown, Westminster, Ennismore, Wyoming, Haileybury.
21. Paris, Bala, Peterboro, Arden, Jermyn, Lion's Head, Deer Park, Sturgeon Falls, Guelph.
26. Vancouver.
27. Pincher Creek.
28. Lethbridge, Coquitlam, Stuart's Lake.
31. Hillview, St. Albans.

Appearance of Spring Birds, &c. :—

ROBINS.—Birnam, 7th ; Jermyn, 16th ; Georgetown, 7th ; Sarnia, 12th ; Beatrice, 12th ; Point Clark, 2nd ; Stony Creek, 6th ; Clontarf, 11th ; Erasmus, 6th ; Agincourt, 11th ; Bruce Mines, 20th ; Dunnville, 7th ; Golden, 23rd ; Meaford, 9th ; Orillia, 12th ; Lakefield, 9th ; Owen Sound, 6th ; Peterborough, 12th ; Hamilton, 15th ; Huntsville, 16th ; Scarboro, 10th ; Wooler, 9th ; Montague, 13th ; Lansdowne, 13th ; Ursa, 15th ; Dutton, 5th ; Collingwood, 12th ; Welland, 9th ; Brome, 11th ; Ridgetown, 2nd ; Otonabee, 9th ; Tobacco Plains, 22nd ; Vankleek Hill, 13th ; Bridgetown, 11th ; Croydon, 11th ; Wiarton, 9th ; Emsdale, 10th ; Dealtown, 7th ; Ennismore, 8th ; Princeton, 10th ; Kinmount, 9th ; Gravenhurst, 10th ; Fredericton, 22nd ; Gravenhurst, 16th ; Stratford, 8th ; Truro, 23rd ; Lucknow, 9th.

BLUE-BIRDS.—Birnam, 11th ; Stony Lake, 11th ; Clontarf, 8th ; Meaford, 13th ; Peterborough, 18th ; Brantford, 10th ; Welland, 5th ; Ridgetown, 13th ; Tobacco Plains, 22nd ; Erasmus, 9th ; Albemni, 15th ; Wiarton, 19th ; Arden, 7th ; Lansdowne, 13th ; Dutton, 6th ; Georgetown, 7th ; Stratford, 17th ; Port Stanley, 5th ; Lucknow, 9th.

BLACK-BIRDS.—Savanne, 11th ; Stony Creek, 12th ; Meaford, 18th ; Lakefield, 11th ; Peterborough, 16th ; Brantford, 7th ; Otonabee, 11th ; Erasmus, 13th ; Arden, 6th ; Scarboro, 28th ; Montague, 13th ; Dutton, 29th ; Princeton, 9th ; Georgetown, 14th ; Fredericton, 22nd ; Stratford, 11th.

KILLDEER PLOVER.—Birnam, 11th ; Meaford, 14th ; Erasmus, 18th ; Georgetown, 14th.

SONG SPARROWS.—Sussex, 21st ; Dutton, 2nd ; Georgetown, 6th.

DUCKS.—Stony Creek, 6th ; Welland, 14th ; Cartwright, 30th ; Hillview, 31st ; Smith's Falls, 3rd.

CROWS.—Hillview, 30th ; Savanne, 11th ; Clontarf, 1st ; Meaford, 5th ; Orillia, 3rd ; Lakefield, 8th ; Owen Sound, 14th ; Collingwood, 14th ; Brome, 4th ; Moose Jaw, 29th ; Almasippi, 23rd ; Princeton, 11th ; Wiarton, 9th ; Arden, 1st ; Emsdale, 8th ; Ursa, 11th ; Hillview, 30th ; Cartwright, 26th ; Haliburton, 3rd ; Fredericton, 8th ; Stuart's Lake, 24th ; Lucknow, 3rd ; St. Albans, 27th ; Gretna, 29th, Rapid City, 24th.

PHOEBE.—Lakefield, 17th.

WILD GEESE.—Stony Creek, 17th ; Welland, 4th ; Moose Jaw, 28th ; Gleichen, 29th ; Victoria, Alta, 31st ; Otonabee, 5th ; Tobacco Plains, 9th ; Summerside, 9th ; Bruce Mines, 23rd, Montague, 13th ; Lansdowne, 14th ; Ennismore, 12th ; Cartwright, 30th ; Morden, 20th ; Norquay, 31st ; Stuart's Lake, 30th ; Rapid City, 31st.

MEADOW LARKS.—Meaford, 17th; Grenfell, 6th; Agincourt, 14th; Princeton, 19th; Wiarton, 19th; Scarboro', 21st; Lansdowne, 20th.

GREY-BIRDS.—Meaford, 17th; Agincourt, 13th; Scarboro', 13th; Georgetown, 14th.

SWALLOWS.—Tobacco Plains, 27th; Victoria, 22nd.

GULL.—Lakefield, 11th.

FROGS.—Princeton, Ont., 10th; Welland, 11th; Port Burwell, 14th; Birnam, 16th; Alberni, 17th, Erasmus, 17th; Brome, 18th; Ennismore, 19th; Toronto, 19th; Hamilton, 19th; Brantford, 19th; Owen Sound, 20th; Scarboro', 27th; Stratford, 17th.

SNIFE.—Beaver Hills W., 31st.

FORECASTS FOR MARCH, 1903.

The forecasts issued by this office at 11 p.m. each night, are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of predictions issued during the month was 928. These were divided as follows:—

DISTRICT.	No. Issued.	VERIFIED.			
		No. Fully.	No. Partly.	No. Not.	Percentage.
Manitoba,	79	57	17	5	82.9
Lake Superior,	80	57	19	4	83.1
Lower Lake Region,	93	67	18	8	81.7
Georgian Bay,	91	67	16	8	82.4
Ottawa Valley,	90	56	23	11	75.0
Upper St. Lawrence,	90	60	19	11	77.2
Lower St. Lawrence,	91	66	12	13	79.1
Gulf,	86	61	15	10	79.6
Maritime Provinces, West,	114	79	25	10	80.3
Maritime Provinces, East,	114	81	20	13	79.8
Total,	928	651	184	93	80.1

FORECASTS ISSUED AT VICTORIA, BRITISH COLUMBIA.

DISTRICTS.	No. Issued.	VERIFIED.			
		No. Fully.	No. Partly.	No. Not.	Percentage.
Vancouver and vicinity,	113	88	3	22	79.2
Island of Montreal,	163	74	14	15	78.6
Total,	276	162	17	37	78.9

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART,

Meteorological Office, Toronto,

Director.

27th April, 1903.

DEPARTMENT OF MARINE AND FISHERIES, CANADA.

METEOROLOGICAL SERVICE.

Monthly Weather Review.

VOL. XXVII.

APRIL, 1903.

No. 4.

INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the material used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

REMARKS UPON THE WEATHER.

The weather over the Lower Mainland and Islands of British Columbia was somewhat cool with occasional frost up to the 14th, after which it turned milder and continued so to the end of the month. Cloudy weather with showers occurred frequently, more especially during the first half of the month, but in most districts the precipitation was comparatively light. Over the Upper Mainland the temperature conditions were similar to conditions to the westward, there being a marked rise after the 14th, but the nights were cold and frost was recorded frequently throughout the month. The precipitation, which was light in most localities, was more general during the first ten or twelve days of the month when the sky was almost continuously overcast. After the 12th, however, bright sunshine occurred frequently. Vegetation throughout the Province was somewhat backward.

The weather in Alberta during the first two weeks was generally cool and dull, and precipitation occurred occasionally, after which it was much finer. Similar conditions prevailed in Assiniboia and Saskatchewan, but in some districts fine weather also occurred from the 2nd to 8th. The precipitation throughout the Territories was chiefly snow during the first half of the month; rain was general on or about the 23rd, and also occurred at a few places on the 19th and 27th. Cold nights with frequent hard frosts were general, more especially from the 1st to the 15th. Vegetation was backward, and there was little growth until late in the month.

In Manitoba the weather followed somewhat the same sequence as in the Territories, but it was generally milder, and there was a marked rise in temperature on or about the 7th. Frosts were frequent, and the last two or three days of the month were quite cool. Precipitation was general on the 3rd, 10th, 23rd and 27th, but the aggregate quantity for the month was small. Vegetation was normal.

In Ontario extremely dull weather and frequent rain were general during the first sixteen days, after which it was somewhat finer; but the sky was very often overcast, and rain again occurred in the southern portion on or about the 23rd and 30th. In northern districts rain was much less frequent, and, the woods drying quickly, great damage was caused by bush fires. Frost was recorded on many nights, but the temperature was occasionally between 50° and 60° during the day, and on the last three days these temperatures were exceeded considerably. On the 30th, after a fall of rain with high winds, the temperature dropped from above 70° to near the freezing point in a few hours. Thunder was recorded at some stations on the 2nd and 30th, and on the 4th a fall of snow occurred in most districts. Vegetation, which was somewhat forced during March, made much slower progress during April, and in most districts it was normal on the 30th.

The weather in the Province of Quebec was mostly mild and dry in western districts and somewhat cool and wet elsewhere. Rain or snow was almost general on or about the 3rd, 7th, 9th, 29th and 30th, little precipitation occurring at any station from the 9th to the 29th, when there was much bright sunshine. Vegetation was well forward in the western portion of the Province, but elsewhere growth was somewhat retarded by the cool weather.

In New Brunswick the sky was almost continuously overcast up to the 18th, and rain or snow was quite frequent at most places during this period. Fine weather then ensued and continued to the end of the month. A marked rise in temperature occurred on the 21st, and the weather continued quite mild after this date. In most districts vegetation was normal.

The weather conditions in Nova Scotia were somewhat similar to conditions in New Brunswick, much cloudiness and frequent precipitation being general up to the 18th, after which it was fair almost continuously to the end of the month. Frosts occurred almost nightly, and there was no marked change to milder weather until the 21st. On the 30th vegetation was somewhat backward.

In Prince Edward Island, cloudy weather with occasional rain or snow was general up to the 18th, after which date there was much bright sunshine to the last day of the month. Frosts occurred frequently, and altogether the weather was somewhat cool and vegetation was backward.—F. F. PAYNE.

ATMOSPHERIC PRESSURE.

The mean atmospheric pressure for April was deficient over the greater portion of Canada, the only districts showing an excess being Saskatchewan, Northern Alberta and British Columbia. The departure from normal values ranged between -0.11 of an inch at Grand Manan, N.B., and $+0.09$ of an inch at Barkerville, B.C.

HIGH AREAS.

A characteristic of the highs seems to have been a tendency for an abnormal southerly movement.

No. 1 was north of the Great Lakes on the morning of the 1st; it increased as it passed south-eastward across the Maritime Provinces, where, on the 2nd, very hard frosts occurred. No. 2.—A high entered the Continent from the Pacific on the 2nd, moved eastward and south-eastward as a feeble area, and early on the 4th covered the Mississippi Valley; then it appeared to have joined forces with another which was first observed north of the Great Lakes, and on the 4th was centred in Ontario. The combined system passed away eastward and south-eastward, the accompanying weather being characterized by very low temperature. No. 3 developed over the Great Lakes during the night of the 9th; on the 10th it was quite pronounced, and lay over Northern and Eastern Ontario, but it then gradually diminished without moving very much. No. 4.—From the 13th to the 15th pressure was for the most part high over Northern Canada, especially in Manitoba and the Gulf, but no very definite movements can be charted. On the 16th the high pressure disappeared from the Gulf, and that in the west drew slowly south-east across the Great Lakes, gradually disappearing. No. 5.—A very gradual development of a high area occurred over the North-west Territories during the 19th and 20th, and during the next few days it passed slowly eastward and south-eastward, almost disappearing over the Southern States on the 24th. No. 6.—On the 24th another high area developed over Manitoba and the neighbouring Territories, and, like its predecessor, passed slowly eastward and south-eastward, disappearing over the Southern States about the 29th. No. 7.—The last area of the month was perhaps the most important. It probably originated in the extreme North-west Territories, and by the morning of the 28th covered all the Territories, accompanied by very cold weather. During the last two days it passed slowly southward.

LOW AREAS.

Twelve areas of low pressure have been charted, and of these, two gave fairly general moderate to heavy gales from the Lakes to the Maritime Provinces. A characteristic feature was an apparent tendency to leave the Atlantic Coast further south than is usual. No. 1 probably originated over the Western States and passed rapidly eastward across the Great Lakes, St. Lawrence Valley and Gulf, accompanied by numerous rains and high winds. While still over the St. Lawrence Valley a secondary (No. 2) was observed to be forming in the Mississippi Valley, and this proved the more important area of the two. It passed south of the Great Lakes and St. Lawrence where a heavy rain was followed by a considerable snowfall with northerly gales, and in the Maritime Provinces there was a heavy rainfall and south-west gale. The influence of No. 3 was chiefly in the North-western States, but during its presence on the 5th and 6th there was a fall of sleet and snow in New Ontario, and subsequently as it passed across far Northern Canada there were heavy local rains in Ontario, Quebec and the Maritime Provinces, and a southerly gale on the Atlantic Coast. No. 4 was first observed in the far south-west, and passed south of the Lakes to the Middle Atlantic Coast, and thence north-eastward across the Maritime Provinces where there was a very heavy rainfall and gales. No. 5 was an unimportant area which moved south-eastward from Alberta on the 7th, passing off the New England Coast on the 10th. Showers occurred generally along its path. No. 6 was decidedly important: it apparently had its birth about the 8th in the extreme Western States and moved slowly to the Middle States, and while almost stationary there during the 14th and 15th, a heavy rainfall occurred in Southern Ontario. A secondary, No. 7, formed over the Middle Atlantic States on the 14th, and thence moved north-eastward near the Atlantic Coast, and on

the 16th and 17th there was a fairly general fall of rain and sleet in the Maritime Provinces. No. 8 moved from the Western States to the South Atlantic Coast between the 17th and 20th and thence north eastward, skirting the coast, it did not materially affect Canadian weather. No. 9 was a feeble depression which passed north eastward near the Atlantic Coast and on the 24th caused showers in Nova Scotia. No. 10 was a shallow depression, which, between the 21st and 26th, passed south eastward from the North-west Territories to the South Atlantic Coast, it gave general showers in Manitoba and the Territories and local showers in Southern Ontario. No. 11 passed across Canada from Alberta to the Gulf between the 26th and 29th attended by a few local showers. No. 12 was the most important disturbance of the month. It was first observed over Colorado on the 27th and moved north eastward over the Lakes and down the St. Lawrence Valley, passing beyond the range of observation during May 1st. It was accompanied by moderate to heavy gales from the Great Lakes to the Atlantic. Heavy showers occurred during its passage over Ontario, but in the St. Lawrence Valley showers were but scattered and light.

WINDS.

In British Columbia the south and west directions were most in evidence, but the winds were largely variable. The mileage was not large; no gales were recorded, but the force of a strong breeze was reached on nine, and of a fresh breeze on seven days.

In the North-west Territories the direction, although largely variable, favoured somewhat the south and west. Strong breezes were recorded on twelve days, and fresh, also, on twelve days, and there was one general gale.

In Manitoba no one direction was paramount. There were eleven days with strong breezes, twelve with fresh, and there was one gale.

In the Lake Region the direction favoured somewhat the north and west. There were eight days of strong and twelve of fresh breezes and four gales, the latter occurring on the 2nd, 7th, 13th and 30th.

In the Ottawa and Upper St. Lawrence Valleys the direction was also slightly in favour of the north and west. There were eight days with strong and sixteen with fresh breezes, and there were two gales.

In the Lower St. Lawrence Valley and in the Gulf the north and east direction was rather in evidence. There were six days with strong and fourteen with fresh breezes, and five gales occurring on the 2nd, 4th, 7th, 11th and 30th.

In the Maritime Provinces no one direction was especially marked. There were eight days with strong and eleven with fresh breezes and three gales, the latter on the 3rd, from 7th to 10th, and on the 17th.

Warnings were issued as follows:— In the Lake Region for the storms of the 13th and 30th. In the Lower St. Lawrence Valley and in the Gulf for the storm of the 30th, and in the Maritime Provinces for the storm of the 17th.

A cautionary warning issued to the Lake Stations on the 24th was not justified by subsequent high winds.

In the Lake Region and in the Lower St. Lawrence Valley and the Gulf there was little or no navigation during the early part of the month.

TEMPERATURE.

The temperature was below the average over British Columbia and in Alberta, Saskatchewan and Western Assiniboia, and elsewhere in the Dominion above the average, except to the northward of Lake Superior and in portions of the Gulf of St. Lawrence. In British Columbia and the North-west Territories the negative departures varied between 1 and 4 degrees; the positive departures were from 2 to 3 degrees in Manitoba; from 1 to 5 degrees in Ontario; from 1 to 3 degrees in Quebec, and from 0 to 2 degrees in the Maritime Provinces.

The Highest and Lowest temperatures in each Province during April, 1903, were:

British Columbia,	75°·5 on 20th at Spence's Bridge.	10°·0 on 10th at Glacier.
North-west Territories,	78°·0 on 22nd at Medicine Hat.	— 2°·0 on 1st at Duck Lake.
Manitoba,	80°·5 on 18th at Brandon.	0°·0 on 5th at Bowman.
Ontario,	82°·0 on 29th at Stony Creek.	—19°·0 on 4th at White River.
Quebec,	82°·2 on 30th at Montreal.	2°·6 on 5th at Chicoutimi.
New Brunswick,	73°·8 on 29th at Fredericton.	4°·0 on 2nd at Dalhousie.
Nova Scotia,	71°·5 on 30th at Bridgetown.	14°·3 on 7th at Truro.
Prince Edward Island,	67°·5 on 30th at Summerside.	12°·0 on 6th at Hamilton.

PRECIPITATION.

The precipitation was considerably above average throughout the Maritime Provinces and a little above average in Southern Ontario, and also in North-western Saskatchewan and the more northern portion of Alberta and British Columbia. The most marked deficiency occurred in Western Quebec and the more eastern and northern portions of Ontario, where in many localities less than an inch was recorded. At the close of the month a considerable amount of snow lay on the ground near the north shores of Lake Superior, both in the bush and on the open country. In Cariboo also one foot was still reported on the level ground with very deep snow on the mountains.

BRIGHT SUNSHINE.

Bright sunshine was a little in excess of average over the North-west Territories, but deficient in all other portions of the Dominion, and especially so in Quebec and the Maritime Provinces, Montreal registering 7 per cent less than the average amount, and Fredericton 11 per cent less. The highest amounts registered were 55 per cent of the possible at Battleford, 53 at Gravenhurst and 47 at Winnipeg, and the lowest amounts were 22 per cent at Agassiz, 37 at Victoria and 35 at Fredericton.

[illegible]

PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c., DURING
APRIL, 1903

STATIONS.	RAINFALL.					SNOWFALL.				REMARKS.
	Amount in inches.	No. of Days of or Over.	No. of Fall Days.	Heaviest Fall in Month	Date.	Amount in inches.	No. of Days.	Heaviest Fall in Month	Date.	
BRITISH COLUMBIA	in.			in.		in.		in.		
Port Essington.....	8.40	20	10	1.83	7-26					
Caulfields.....	2.42	16	13	0.50	22					
Goldstream Lake.....	3.43	12	18	1.13	7					
Royal Oak.....	1.71	8	22	0.72	7					
Kuper Island.....	1.64	10	20	0.39	22					29th, fresh snow on moun-
Nanaimo.....	1.56	7	23	0.51	21					tains.
Sooke Lake.....	3.83	10	20	1.20	7					
Coquitlam.....	5.34	13	17	1.11	21					Snow with rain on 8th and
										9th.
N. W. TERRITORIES—										
Stirling.....						5.0	2	3.0	4	
Innisfail.....	0.04	1	21	0.04	26	0.8	8	0.3	10	
Salteoats.....	0.36	3	26	0.32	9	1.0	1	1.0	4	9th, $\frac{1}{2}$ in. ice on running
Bruderheim.....	0.28	3	24	0.25	22	18.0	4	17.0	11	water.
Beaver Hills W.....	0.43	3	16	0.40	22	9.5	6	7.5	10	
Willow Bunch.....	0.57	2	27	0.39	23	4.0	1	4.0	11	21st, grass getting green.
Victoria.....	0.41	3	21	0.46	18	5.0	7	3.0	11	
Weyburn.....	1.20	3	27	0.80	23					
Regina.....	0.86	5	23	0.33	24	2.1	3	2.0	11	
Beaver Hills E.....	1.05	4	21	0.80	23	19.0	5	14.0	10	
Gleichen.....	R	0	24	R	30	6.0	4	3.5	1	
MANITOBA —										
Norquay.....	0.38	4	23	0.24	23		3			
Moreton.....	0.11	5	24	0.04	24	0.5	1	0.5	5	1st, thunder.
Morden.....	0.17	2	23	0.17	11		3			
Beaver.....	0.27	3	27	0.21	11					
Belmont.....	0.60	1	25	0.53	23		1			
Lansdowne.....	0.33	2	28	0.25	10					
Cartwright.....	0.30	1	20	0.30	23					
Rapid City.....	R		27	R	23	2.0	2	2.0	4	
Almasippi.....	0.43	3	25	0.26	23	1.5	2	1.0	3	
Gretna.....	0.65	5	9	0.23	1	11.0	4	11.0	5.6	
ONTARIO—										
Cayuga.....	2.70	12	16	1.19	4	0.5	3	0.5	4	
Sunshine.....	0.53	5	23	0.29	7	1.5	1	1.5	4	
Emsdale.....	2.25	7	23	1.26	3		2		21	Thunder, 2.30; aurora,
										25th.
Warton.....	0.91	6	23	0.34	14		1		21	Thunder, 2.
Aurora.....	1.16	8	22	0.34	6	2.5	2	2.5	3	
Watford.....	1.52	8	22	0.40	14					
Scarboro.....	2.28	11	18	1.17	14	1.0	2	1.0	3	
Oliver's Ferry.....	1.34	4	26	0.85	4		1			
Lion's Head.....	1.14	9	21	0.26	14					
Uxbridge.....	2.10	8	22	0.75	11	4.0	1	4.0	3	
Midland.....	0.99	6	23	0.33	3		1			
Orangeville.....	1.74	7	22	0.39	7	4.8	1	4.8	4	
Goderich.....	1.40	6	22	0.40	30	4.5	2	4.0	3	
Huntsville.....	2.17	4	25	0.90	2	0.5	1	0.5	4	
Croydon.....	2.60	4	25	0.70	3	3.0	1	3.0	4	26th, ice on water.
Wooler.....	2.03	6	24	1.15	15	2.5	1	2.5	3	
Montague.....	1.64	3	26	0.70	3	3.5	1	3.5	4	
Port Burwell.....	3.90	10	20	2.14	3	0.5	1	0.5	3	
Wyoming.....	2.05	8	22	0.64	14		1			
Georgetown.....	2.64	11	17	1.08	14	2.2	3	1.8	4	
Arlen.....	1.32	8	22	0.41	6	4.0	1	4.0	4	
Westminster.....	3.31	10	20	0.92	3	2.0	1	2.0	3	
Deer Park.....	3.68	8	21	1.87	14	4.0	3	4.0	4	
Westport.....	2.16	3	25	1.20	6	3.0	2	2.5	3	
Nottawasaga Island.....	0.60	2	27	0.40	9	2.0	1	2.0	3	
Dutton.....	1.40	5	21	0.45	16	2.0	1	2.0	4	
Dealtown.....	4.26	8	21	1.60	3	2.0	2	2.0	4	
Smith's Falls.....	0.90	3	24	0.35	6	2.5	2	2.5	7	
Lansdowne.....	0.87	4	25	0.41	15	2.0	2	2.0	3	
Ursa.....	2.21	9	21	0.47	6					
Parma.....	2.22	5	25	0.85	4					
Ennismore.....	1.67	7	23	0.46	8	3.0	1	3.0	3	
Princeton.....	2.73	11	18	0.95	3	3.0	2	3.0	4	
Jermyn.....	1.99	5	25	0.62	14	5.0	1	5.0	3	
Providence Bay.....	1.55	11	19	0.63	2					
NEW BRUNSWICK —										
Point Esquimaux.....	1.10	4	23	0.72	9	11.4	5	4.2	5	
NOVA SCOTIA—										
Port Morien.....	2.32	7	22	0.60	8	1.5	1	1.5	21	

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE
SUN WAS ABOVE THE HORIZON IN THE MONTH OF APRIL, 1903.

	HOURS ENDING															
	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.
Victoria	0 10	0 03	0 25	0 40	0 45	0 53	0 60	0 60	0 60	0 60	0 55	0 48	0 42	0 15	0 00	...
Nanaimo	0 02	0 27	0 43	0 54	0 61	0 58	0 52	0 52	0 50	0 53	0 44	0 42	0 30	0 03	...	...
Agassiz	0 00	0 02	0 07	0 16	0 28	0 38	0 35	0 44	0 42	0 44	0 25	0 12	0 06	...	...	...
Battleford	0 38	0 43	0 58	0 65	0 66	0 69	0 70	0 69	0 65	0 58	0 54	0 47	0 33	0 02	...	...
Indian Head	0 00	0 09	0 49	0 56	0 62	0 64	0 63	0 68	0 65	0 53	0 41	0 16	...	...	...	...
Brandon	0 00	0 28	0 62	0 71	0 71	0 75	0 73	0 76	0 69	0 57	0 45	0 07	...	...	...	...
Winnipeg	0 01	0 14	0 49	0 62	0 70	0 70	0 68	0 68	0 68	0 67	0 57	0 43	0 07	...	...	...
Woodstock	0 23	0 49	0 57	0 61	0 60	0 57	0 58	0 57	0 59	0 50	0 43	0 26	...	...	...	...
Toronto	0 01	0 19	0 47	0 58	0 65	0 56	0 57	0 57	0 61	0 58	0 53	0 54	0 38	0 04	...	...
Lindsay	0 01	0 13	0 36	0 53	0 59	0 63	0 60	0 59	0 60	0 67	0 46	0 40	0 39	0 24	...	...
Barrie	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gravenhurst	0 02	0 37	0 55	0 66	0 65	0 67	0 67	0 69	0 66	0 60	0 55	0 48	0 39	0 22	...	...
Kingston	0 12	0 54	0 61	0 62	0 63	0 58	0 59	0 58	0 54	0 51	0 52	0 24	0 03	...	...	...
Ottawa	0 23	0 49	0 52	0 62	0 61	0 60	0 61	0 61	0 59	0 49	0 47	0 22	...	...	...	...
Montreal	0 00	0 32	0 47	0 52	0 55	0 60	0 57	0 56	0 60	0 48	0 27	0 08	...	...	...	...
Quebec	0 11	0 43	0 51	0 56	0 61	0 62	0 56	0 55	0 53	0 43	0 41	0 17	...	...	...	...
Fredericton	0 12	0 32	0 37	0 35	0 37	0 49	0 52	0 57	0 48	0 47	0 38	0 22	0 03	...	...	...

	Victoria	Nanaimo	Agassiz	Battleford	Indian Head	Brandon	Winnipeg	Woodstock	Toronto	Lindsay	Barrie	Gravenhurst	Kingston	Ottawa	Montreal	Quebec	Fredericton
Mean proportion for month (Constant sunshine being 1.)	0 37	0 42	0 22	0 55	0 40	0 46	0 47	0 44	0 46	0 46	...	0 53	0 45	0 45	0 43	0 41	0 35
Difference from average..	0 02	...	0 03	0 03	0 02	0 02	0 02	0 01	0 03	0 04	...	...	0 03	0 02	0 07	...	0 11
Maximum daily amount	0 78	0 87	0 72	1 00	0 72	0 71	0 80	0 82	0 90	0 91	...	0 95	0 81	0 84	0 90	0 82	0 83
Date,	1	16	27	20	19	19	24	18	20	27	...	4	20	27	27	25	6
No. of days completely clouded	3	4	9	3	2	5	9	8	5	6	...	3	6	5	7	2	6

Aurora recorded. —

Where the class of aurora is noted by the observer, it is given, (I) being the brightest, (IV) the feeblest in brilliancy.

4. Melfort.
5. Fredericton, brilliant Bowsman, III ; Gray Hill, Melfort, Moosejaw, Swift Current, IV.
6. Truro, IV.
21. Beatrice, III.
25. Emsdale, III.
26. Quebec, IV ; Savanne, Bruce Mines, IV ; Meaford, Haileybury, IV ; Shawinigan Falls.
27. Minnedosa, IV.
28. Grey Hill.

Thunder recorded on —

1. Agincourt, Moreton.
2. London, Lindsay, Sturgeon Falls, Gravenhurst, Parry Sound, Port Stanley, Bissett, Kinnmount, Birnam, Hamilton, Beatrice, Paris, Bruce Mines, Agincourt, Meaford, Dunnville, N. Gower, Belleville, Stony Creek, Collingwood, Dealtown, Smith's Falls, Ursa, Port Burwell, Westminster, Huntsville, Emsdale, Clontarf, Ridgetown, Lakefield, Peterboro', Rocklyn, Otonabee, Uplands, Erasmus, Wiarton, Haliburton.
3. St. Agathe, Port Stanley, Brome, Lakefield, Parma, Arden, Midland.
4. Lion's Head, Providence Bay.
7. Croydon.
9. Meaford, Erasmus.
10. Barnardo.
11. Dealtown.
18. St. John's, Coquitlam.
22. Chilliwack, Medicine Hat, Bermuda, Gray Hill, Wetaskiwin.
24. Sable Island, Chicoutimi.
30. Parry Sound, Toronto, Kinnmount, Meaford, Agincourt, Peterboro', Ursa, Emsdale.

Appearance of Spring Birds, &c. :—

SWALLOWS.—Rivers Inlet, 20th ; Golden, 24th ; Alberni, 1st ; Massett, 8th ; Clinton, 30th ; Agincourt, 28th ; Ridgetown, 24th ; Erasmus, 25th ; Westport, 20th ; Ursa, 27th.

HUMMING-BIRDS.—Rivers Inlet, 20th ; Alberni, 23rd ; North Nicomen, 23rd ; Kuper Island, 19th.

MEADOW LARKS.—Minnedosa, 5th ; Hillview, 11th ; Almasippi, 13th ; Melfort, 9th ; Chaplin, 13th.

THRUSH.—Minnedosa, 5th.

BLACKBIRDS.—Dutton, 19th.

WILD GESE.—Princeton, 15th ; Hillview, 2nd ; Bowsman, 12th ; Athabasca Landing, 23rd ; Gray Hill, 20th ; Didsbury, 7th ; Melfort, 2nd ; Estevan, 9th ; Wetaskiwin, 9th ; Duck Lake, 3rd ; Bruederheim, 15th ; Westport, 9th ; Ursa, 2nd.

PURPLE FINCH.—St. Stephen, 18th.

GULLS.—Bruce Mines, 1st.

PHOEBE.—Agincourt, 25th.

WOODPECKER.—Lakefield, 13th ; Melfort, 25th.

DUCKS.—Hillview, 10th ; Almasippi, 6th ; Bowsman, 12th ; Athabasca Landing, 22nd ; Gray Hill, 7th ; Didsbury, 3rd ; Melfort, 2nd ; Manor, 1st ; Wetaskiwin, 9th ; Chaplin, 1st ; Bruederheim, 15th ; Moreton, 12th.

ROBINS.—Hillview, 18th ; Bowsman, 21st ; Athabasca Landing, 22nd ; Gray Hill, 15th ; Manor, 13th ; Wetaskiwin, 12th ; Willow Bunch, 25th.

FROGS.—Minnedosa, 23rd ; Summerside, 27th ; Bridgetown, 4th ; Windsor, 21st ; Savanne, 29th ; Bruce Mines, 11th ; Huntsville, 9th ; Agincourt, 23rd ; Clontarf, 12th ; Hillview, 18th ; Oak Bank, 17th ; Almasippi, 12th ; Bowsman, 19th ; Athabasca Landing, 22nd ; Gatesgarth, 16th ; Didsbury, 18th ; Manor, 9th ; Estevan, 7th ; Duck Lake, 24th ; Bruederheim, 21st ; Ursa, 6th ; Lansdowne, 7th ; Moreton, 12th.

FORECASTS FOR APRIL, 1903.

The forecasts issued by this office at 11 p.m. each night, are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of predictions issued during the month was 878. These were divided as follows:—

DISTRICT.	Issued.	VERIFIED.			Percentage.
		No. Fully.	No. Partly.	No. Not.	
Manitoba	84	58	23	3	82.7
Lake Superior	109	71	31	7	79.4
Lower Lake Region	126	98	18	10	84.9
Georgian Bay	123	85	26	12	79.7
Ottawa Valley	101	76	18	7	81.2
Upper St. Lawrence	101	76	20	5	85.1
Lower St. Lawrence	110	78	27	5	83.2
Gulf	109	77	25	7	82.1
Maritime Provinces, West.	106	73	24	9	80.2
Maritime Provinces, East.	102	64	30	8	77.5
Total	1,071	756	212	73	81.9

FORECASTS ISSUED AT VICTORIA, BRITISH COLUMBIA.

DISTRICTS.	No. Issued.	VERIFIED.			Percentage.
		No. Fully.	No. Partly.	No. Not.	
Victoria and vicinity	120	87	11	22	77.1
Lower Mainland	109	74	19	16	76.6
Total	229	161	30	38	76.9

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. E. STUPART,

Director

Meteorological Office, Toronto.

28th May, 1903.

DEPARTMENT OF MARINE AND FISHERIES, CANADA.

METEOROLOGICAL SERVICE.

Monthly Weather Review.

VOL. XXVII.

MAY, 1903.

No. 5.

INTRODUCTION

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the material used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

REMARKS UPON THE WEATHER.

The weather on the Lower Mainland and Islands of British Columbia was somewhat dull, cool, and dry. Light showers were frequent, and much continuous bright sunshine was only recorded during the first five or six days, and on or about the 16th, 17th, and 18th. On the Upper Mainland the weather was somewhat finer than in districts further westward, but low temperatures were general, and the rainfall was light. Frosts were recorded at many places on several days up to the 23rd, but after this date there was a marked rise in temperature, from 80° to 85° being noted at many places. On the 31st, vegetation was generally backward throughout the Province.

Throughout the greater portion of the North-west Territories the weather was quite cool and exceedingly dull and wet during the second half of the month when most of the precipitation was recorded. High temperatures occurred on or about the 6th, 12th, 26th, and after the 28th at most places. Frosts were somewhat frequent, and a snowstorm was reported from many stations on or about the 18th, the wind continuing high for six or seven days. Vegetation was much retarded by low temperatures, the frost in some districts doing much damage.

In Manitoba the weather was mostly fine up to the 16th, and dull with occasional rain after that date, it being generally warmer than in the Territories and altogether more favourable for vegetation. Frosts were general, but those occurring late in the month were light in most districts and do not appear to have caused any damage. High winds were recorded from the 17th to 23rd.

The weather in Ontario was extremely fine and dry, there being very few days upon which the sky was completely clouded, and on many days not a cloud was visible. Rain, which was below the average, was recorded at most places on or about the 3rd, 6th, 14th, and upon several days after the 19th. Heavy thunder storms were general on the 26th and 27th. In the eastern portion of the Province there was much drouth, the showers occurring being mostly light. A marked rise in the temperature took place on the 9th, and the weather continued warm to the 28th, when it again turned quite cool. Occasional frosts were noted in some districts during the first week, also at some places on the last two days, but little damage appears to have been caused thereby. Vegetation was somewhat retarded by drouth, more especially in eastern counties.

In the Province of Quebec the weather was generally fine and warm and exceedingly dry, the drouth causing much damage in western districts, where forest fires were numerous and extensive. In the eastern portion rain was more plentiful but it was considerably below the average in quantity. High temperatures were recorded almost every day from the 7th to the 29th, when, after a fall of rain, there was a sudden drop, the weather becoming much cooler. Hard frosts were general and did much damage in some districts. Vegetation was quite backward.

The weather in New Brunswick was exceptionally fine and somewhat warm and dry. Heavy rains occurred on or about the 5th and 21st, lasting several days upon each occasion, and there were a very few light showers on other dates. In some districts the drouth was severe and there were many forest fires. Frosts were frequent, and together with the drouth retarded growth in vegetation.

In Nova Scotia the weather was mostly fine but exceedingly dry, the drouth equalling that in Western Quebec. In most districts it was also somewhat cooler than usual and occasional frosts were recorded up to the 27th. Showers were noted at most stations on or about the 8th, 21st and 29th, but they were generally light. Forest fires were reported from several districts, and vegetation was exceedingly backward.

The weather in Prince Edward Island was somewhat cool and excessively dry. A few showers occurred on the 6th and 7th, also between the 19th and 22nd, but with these exceptions, drouth was almost continuous. Frosts were of frequent occurrence, and snow and sleet were reported on the 24th. Vegetation throughout the Province was quite backward on the 31st.—F. F. PAYNE.

ATMOSPHERIC PRESSURE.

The mean atmospheric pressure for May exceeded the normal in British Columbia, and from the Great Lakes to the Atlantic, whilst over Manitoba and the North-west Territories, it was subnormal. The range of departure was 0.31 of an inch, the extremes being — 0.10 of an inch at Prince Albert, N.W.T., and + 0.21 of an inch at White River, Ontario.

HIGH AREAS.

A feature of the high areas this month was the persistency with which they hovered over Northern Canada between Lake Superior and the Maritime Provinces. Five areas have been charted, and only one, and that quite at the beginning of the month, can be traced from the Pacific Coast and across the United States, while the remaining four were first observed near Lake Superior, or but a short distance further west. The weather accompanying this almost continuous high pressure over Canada was typical of anticyclonic conditions, bright sunshine and drought having been prevalent in the Dominion from Ontario to the Maritime Provinces. The weather in Manitoba and the Territories was seldom dominated by high pressure, and was more generally characteristic of the outskirts of cyclonic disturbance.

LOW AREAS.

The low areas were as abnormal as were the high areas, eight have been charted, and seven of these were first observed over the South western States. No. 1 can be tracked across the Western States to Illinois, and then north eastward across the Great Lakes, where on the 3rd there were high winds and a fairly general rainfall, further east it rapidly disappeared, and only a few scattered showers occurred. No. 2 was the only purely north-west area of the month; it was well marked over our Canadian Territories on the 7th, accompanied by scattered showers; after this it disappeared. Nos. 3, 4 and 8, were confined to the Southern States and did not affect Canadian weather. Nos. 5 and 6 were both first observed in the far south-west, and moved northward to the Canadian Territories and Manitoba, where on the 18th and 19th, and again on the 21st and 22nd there was heavy and widespread precipitation, which in the former instance was partly in the form of snow. No. 7 was the only area of any importance which moved across the Great Lakes; it gave a fairly heavy rain in Western Ontario during the night of 27th, but only scattered showers further east.

WINDS.

The wind mileage was below average in all parts of the Dominion, unless perhaps, in the North-west Territories and Manitoba, where strong winds and gales were prevalent about the middle of the month. The month opened with fresh westerly gales blowing in the St. Lawrence Valley, a heavy gale in the Gulf and moderate south westerly and westerly gales in the Maritime Provinces. On the 3rd there was a moderate westerly gale on the Great Lakes; on the 24th, a strong northerly gale in Cape Breton, and on the 28th, a moderate south westerly gale on the Lower Lakes, and a north westerly gale on Lake Superior. South and west were the prevailing directions on Vancouver Island, but on the mainland, especially the northern portion, there was a preponderance of easterly winds. In Manitoba and the Territories the winds were very variable, with a slight tendency in favour of south and west, while on Lake Superior there was a marked preponderance of north and east winds. On the Lower Lakes easterly winds were decidedly prevalent; further east in the St. Lawrence Valley, the number of south westerly winds nearly balanced the north easterly, and much the same statement holds good in the Maritime Provinces.

TEMPERATURE.

The mean temperature of May was, as in March and April, above average from Manitoba to the Maritime Provinces, the largest excess again being in Ontario and Quebec, and the greatest positive departure reported, 7° at Parry Sound. To the westward of Manitoba it was, on the contrary, lower than average with the largest negative departures, from 4° to 5° in Eastern Alberta. In British Columbia the negative departure was between 1° and 3°.

The Highest and Lowest temperatures in each Province during May, 1903, were

British Columbia,	90°·9 on 31st at Okanagan Mission.	19°·0 on 2nd at Cranbrook.
North-west Territories,	93°·0 on 11th at Gatesgarth	10°·0 on 1st at Alameda.
Manitoba,	93°·0 on 14th at Dauphin.	7°·0 on 1st at Almasippi.
Ontario,	91°·0 on 17th at Sarnia.	11°·2 on 1st at White River.
Quebec,	85°·0 on 20th at Richmond.	14°·0 on 2nd at St. Agathe des Monts.
New Brunswick,	83°·5 on 17th at Chateau.	20°·0 on 3rd at St. Stephen.
Nova Scotia,	81°·5 on 18th at Halifax.	21°·2 on 3rd at Truro.
Prince Edward Island,	73°·2 on 17th at Charlottetown.	27°·0 on 3rd at Hamilton.

PRECIPITATION.

The rainfall of the month has been in excess of the average throughout the North-west Territories, Manitoba and New Ontario, and below the average in all other portions of the Dominion except in a few localities near Lake Erie. In the extreme eastern portions of Ontario and in Western Quebec the deficiency has been unprecedented in May, only a few very light showers having occurred, aggregating but a small fraction of an inch. In the more western and southern parts of Ontario the deficiency was by no means so pronounced, and a copious rainfall on the 26th and 27th extended eastward to about Peterboro' and Port Hope. In Eastern Quebec and in New Brunswick the fall was very generally something over an inch, but in Nova Scotia, excepting Cape Breton, and in Prince Edward Island, it was still more scant, and in some districts only amounted to a few tenths of an inch.

BRIGHT SUNSHINE.

The mean amount of bright sunshine was subnormal from British Columbia to Manitoba, and exceeded the normal from Ontario to the Maritime Provinces. Battleford, N.W.T., Brandon and Winnipeg, Man., reported a deficiency of 0·11, and Woodstock, Ont., an excess of 0·19. Agassiz, B.C., recorded the minimum amount 0·27, and Gravenhurst, Ont., the maximum 0·68.

[illegible]

PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, MAY, 1903

a Barometer not reduced to Sea Level.

[illegible]

PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c., DURING MAY, 1903.

STATIONS.	RAINFALL.				Date.	SNOWFALL.				REMARKS.
	Amount in inches.	No. of Days 90 or Over.	No. of Fair Days	Heaviest Fall in Month		Amount in inches.	No. of Days.	Heaviest Fall in Month	Date.	
	m.			in.		m.		m.		
BRITISH COLUMBIA.										
Revel Oak.	0.92	7	24	0.33	7					
Sooke Lake.	1.70	9	22	0.93	7					
Port Essington.	7.28	27	4	1.35	3					
Capitlam.	3.92	11	20	0.78	8					
Nanaimo.	0.81	8	23	0.27	8					
Goldstream Lake.	2.03	17	14	0.95	7					
Kuper Island.	0.99	14	17	0.24	13					
Nass Harbour.	2.05	9	22	0.45	6					
N. W. TERRITORIES.										
Benedictum.	0.46	7	20	0.12	3	6.5	4	6.0	19	
Lacombe.	3.09	11	14	0.92	16	7.0	4	4.5	18	
New Hope.	3.14	9	22	0.99	19					
Beaver Hills E.	0.51	5	24	0.18	26	0.5	2	0.5	19	
Willow Bunch.	4.37	8	23	2.36	22	8	1	8	18	
Weyburn.	5.02	10	21	2.10	21					
Saltsorts.	3.73	7	24	1.40	17					
Gleichen.	1.39	5	23	0.59	15	16.3	3	12.2	19	
Pakan (Victoria).	1.41	6	22	1.45	3	4.8	3	4.5	19	
Beaver Hills W.	0.62	6	21	0.26	3	7.5	5	6.0	18-19	
Courts.	1.91	7	24	1.00	4	24.0		24.0	17-19	Worst blizzard for years.
Humbold.	1.69	7	19	1.28	16	8.0	4	7.5	17-20	
Regina.	3.14	12	19	0.98	22	*	1		19	
MANITOBA.										
Morden.	2.37	6	22	0.80	18					
Rathwell.	3.20	10	18	0.73	17					
Grima.	1.86	5	10	0.86	23					
Beaver.	2.98	7	24	1.87	17-18					
Belmont.	3.44	12	19	1.77	17-18					
Norquay.	3.39	10	20	0.75	17					
Oak Lake.	4.44	8	23	1.63	22					
Cutwright.	4.26	11	19	1.25	22					
ONTARIO.										
N. Williamsburg.	0.20	1		0.20	22					Potatoes and corn frozen
Sunshine.	2.24	10	21	0.65	27	0.7	1	0.7	1	(black.
Lansdowne.	R	0	30	R	8					Frost on 23rd.
Dutton.	1.20	3	28	0.75	26					
Providence Bay.	0.21	3	26	0.13	27					
Montague.	0.06	1	30	0.06	18					Light land burned up.
Westport.	0.50	3	28	0.36	3					22nd, ice on banks.
Huntsville.	1.46	7	20	0.45	3	0.5	1	0.5	1	
Nottawasaga Island.	1.79	5	26	0.50	3					
Georgetown.	2.56	8	22	0.94	26					Ice, 1st and 5th.
Goderich.	1.37	4	27	0.54	27					
Port Burwell.	2.06	5	26	0.99	26					Ice, 1st, 5th and 6th.
Dealtown.	3.54	5	26	1.12	26					Ice on 1st.
Oliver's Ferry.	0.40	1	30	0.10	3					
Emshole.	2.32	6	24	0.86	3		1		1	1st, ice 1 inch.
Croydon.	0.55	3	28	0.20	27					
Parma.	0.41	2	29	0.23	4					
Prince ton.	2.56	5	26	1.50	26					
Westminster.	1.71	5	26	0.86	26					
Watford.	2.28	6	25	0.75	19					
Scarboro'.	1.69	5	22	1.15	26					Ice, 1st and 2nd.
Aurora.	2.35	7	24	0.96	27					
Emmetsburg.	1.35	2	29	0.75	27					
Midland.	2.28	10	21	0.48	3					
Wooler.	1.48	7	24	0.54	27					
Cayuga.	1.20	6	23	0.80	26					
Lions Head.	2.39	9	22	0.54	3					
Lebridge.	3.75	7	24	2.17	18		1		1	
Smith's Falls.	0.23	2	29	0.17	4		1		1	
Warton.	0.94	9	22	1.10	26					
Arvin.	1.08	3	28	0.75	27					
Alden.	0.61	10	21	0.19	4					
Lynedoch.	1.93	5	26	0.76	27					
Orangeville.	1.87	6	24	0.67	27	0.8	1	0.8	1	
Deer Park.	1.91	6	25	1.01	27		1		1	
Leisa.	1.28	7	24	0.43	3					
Wyoming.	0.51	6	24	1.20	26					
NEW BRUNSWICK.										
Point Escommu.	1.46	6	25	0.76	5					
Port Minto.	1.40	7	24	0.49	23					

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE
SUN WAS ABOVE THE HORIZON IN THE MONTH OF MAY 1903.

HOURS ENDING.

	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.
Victoria	0 00	0 12	0 30	0 40	0 40	0 44	0 60	0 58	0 60	0 56	0 51	0 45	0 42	0 40	0 00	
Nanaimo	0 15	0 33	0 40	0 44	0 40	0 43	0 45	0 42	0 50	0 51	0 49	0 49	0 39	0 23	0 00	
Agassiz	0 00	0 04	0 15	0 28	0 39	0 41	0 54	0 54	0 52	0 47	0 37	0 29	0 12	0 00	0 00	
Battleford	0 23	0 39	0 50	0 54	0 60	0 58	0 52	0 49	0 39	0 38	0 41	0 30	0 33	0 20	0 07	S
Indian Head	0 14	0 20	0 49	0 58	0 60	0 65	0 64	0 61	0 55	0 55	0 56	0 50	0 40	0 12	S	
Brandon	0 00	0 22	0 46	0 54	0 57	0 56	0 60	0 53	0 52	0 56	0 49	0 45	0 39	0 04	0 00	
Winnipeg	0 10	0 44	0 53	0 55	0 58	0 60	0 67	0 62	0 52	0 53	0 54	0 52	0 33	0 09	0 00	
Woodstock	0 07	0 44	0 66	0 76	0 78	0 81	0 91	0 87	0 85	0 85	0 85	0 80	0 64	0 12	0 00	
Toronto	0 04	0 44	0 62	0 73	0 77	0 81	0 82	0 86	0 89	0 86	0 80	0 67	0 64	0 30	S	
Lindsay	0 05	0 16	0 31	0 49	0 62	0 70	0 73	0 77	0 80	0 82	0 78	0 71	0 63	0 60	0 46	0 09
Barrie																
Gravenhurst	0 30	0 64	0 78	0 76	0 74	0 78	0 77	0 76	0 77	0 78	0 77	0 77	0 71	0 64	0 20	
Kingston	0 02	0 46	0 72	0 80	0 84	0 84	0 80	0 84	0 83	0 82	0 82	0 77	0 71	0 20	0 00	
Ottawa	0 12	0 49	0 63	0 69	0 78	0 85	0 84	0 88	0 79	0 73	0 75	0 71	0 59	0 11	0 00	
Montreal	0 09	0 37	0 57	0 57	0 66	0 78	0 78	0 75	0 73	0 75	0 80	0 82	0 64	0 45	0 06	
Quebec	0 07	0 31	0 50	0 63	0 74	0 77	0 73	0 73	0 72	0 78	0 64	0 56	0 40	0 08	0 00	
Fredericton	0 06	0 32	0 56	0 64	0 64	0 63	0 69	0 72	0 75	0 71	0 63	0 50	0 41	0 15	0 00	0 00

	Victoria.	Nanaimo.	Agassiz.	Battleford.	Indian Head.	Brandon.	Winnipeg.	Woodstock.	Toronto.	Lindsay.	Barrie.	Gravenhurst.	Kingston.	Ottawa.	Montreal.	Quebec.	Fredericton.
Mean proportion for month (Constant sunshine being 1.)	0 36	0 37	0 27	0 39	0 42	0 38	0 43	0 63	0 62	0 60		0 68	0 63	0 60	0 63	0 51	0 50
Difference from average.....	0 05	—	0 03	0 11	0 05	0 11	0 11	0 19	0 15	0 14		0 16	0 13	0 12		0 06	
Maximum daily amount	0 79	0 90	0 70	0 97	0 81	0 79	0 84	0 86	0 86	0 98		0 95	0 84	0 87	0 98	0 84	0 87
Date	23	23	16	31	31	31	31	31	30	30		30	31	23	23	23	22
No. of days completely clouded	3	4	9	4	5	5	3	1	0	1		2	0	0	0	1	5

Aurora recorded on:—

Where the class of aurora is noted by the observer, it is given, (I) being the brightest, (IV) the feeblest in brilliancy.

16. Haileybury, III.
22. Pictou, IV; Rat Portage, Cartwright, Calvin, Haileybury, III.
23. Clarke City, IV; Minnedosa, I.
27. Haileybury, IV.
28. Minnedosa, III.
29. Clarke City, IV.
30. Clarke City, IV.

Thunder recorded on:—

3. Gray Hill.
4. Bon Accord.
6. Rocklyn, Meaford, Erasmus, Bermuda.
13. St. Agathe, Bullion, Okanagan Mission, Princeton, Vancouver, Clontarf, Shawinigan Falls, Haileybury.
14. New Westminster, Pilot Bay.
15. Bullion, Okanagan Mission, Rat Portage.
16. Hillview, Almasippi, Oakbank, Bon Accord, Savanne, Weyburn, Brandon, Rathwell, Norquay.
17. Estevan, Haliburton, Lion's Head, Rathwell, Norquay, Winnipeg, Barnardo, Wyoming.
18. Lindsay, Renfrew, Stony Mountain, Hillview, Almasippi, Aweme, Estevan, Belleville, Stony Creek, Port Hope, Agincourt, Dunnville, Erasmus, Deer Park, Jermyn, Uxbridge, Aurora, Scarboro', Georgetown, Rathwell, Norquay, White River, Quebec, Bissett.
19. London, Gravenhurst, Sutton W., Clinton, Ridgetown, Lucknow, Cockburn Island, Beatrice, Agincourt, Birnam, Bruce Mines, Paris, Brantford, Norquay, Port Arthur, Bissett, Shawinigan Falls.
20. Pictou, London, Bowsman, Bala, Port Dover, Brantford, Sunshine, Grand Manan, Quebec, Port Stanley, Nanaimo.
21. Lindsay, Renfrew, Moncton, St. Agathe, Wiarton, Wooler, Sturgeon Falls, Summerside, Chicoutimi, Brome, Kinmount, Welland, Lakefield, Stony Creek, Ridgetown, Clontarf, Birnam, Owen Sound, Paris, Aurora, Emsdale, Nottawasaga Island, Yarmouth, Quebec, Father Point, Saugeen, Parry Sound, Bissett, Wyoming, Calvin, Shawinigan Falls.
22. Pictou, Truro, Point Lepreaux, Almasippi, Rat Portage, Rathwell, Grand Manan.
23. Pictou, St. Mary's, Ridgetown, Dunnville, Croydon, Dealtown, Dutton.
24. Medicine Hat, Port Stanley, Wyoming.
25. Bullion, Did-bury, Estervan, Lakefield, Bruce Mines.
26. Lindsay, London, Gravenhurst, Stony Mountain, St. Mary's, Clinton, Welland, Lakefield, Ridgetown, Lucknow, Sarnia, Port Hope, Beatrice, Agincourt, Birnam, Hamilton, Bruce Mines, Point Clark, Meaford, Owen Sound, Dunnville, Paris, Port Dover, Erasmus, Brantford, Wiarton, Uxbridge, Lion's Head, Cayuga, Midland, Scarboro', Westminster, Port Burwell, Georgetown, Nottawasaga Island, Medicine Hat, Parry Sound, Port Stanley, Wyoming.
27. Lindsay, London, Gravenhurst, Sturgeon Falls, Kinmount, Sutton W., St. Mary's, Clinton, Welland, Lakefield, Bala, Stony Creek, Ridgetown, Rocklyn, Peterboro', Lucknow, Sarnia, Cockburn Island, Port Hope, Beatrice, Birnam, Hamilton, Bruce Mines, Point Clark, Meaford, Owen Sound, Paris, Port Dover, Brantford, Jermyn, Wiarton, Uxbridge, Lion's Head, Ennismore, Scarboro', Westminster, Emsdale, Dealtown, Georgetown, Providence Bay, Nottawasaga Island, Sunshine, Parry Sound, Port Stanley, Bissett, Wyoming, Calvin, Haileybury.
28. Cape Magdalen, Brome, Gray Hill, Bon Accord, Sutton W., Bala, Rocklyn, Peterboro', Haliburton, Agincourt, W. Beaver Hills, Bruderheim, Arden, Wiarton, Lion's Head, Scarboro', Port Stanley, Sunshine, Father Point, Kingston, Bissett.
29. Almasippi, Norquay.
30. Aweme, Belmont.
31. Okanagan Mission.

FORECASTS FOR MAY, 1903.

The forecasts issued by this office at 11 p.m. each night, are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of predictions issued during the month was 1,061. These were divided as follows:

DISTRICT.	No. Issued.	VERIFIED.			Percentage.
		No. Fully.	No. Partly.	No. Not.	
Manitoba.....	81	56	16	9	79.0
Lake Superior.....	108	88	13	7	87.5
Lower Lake Region.....	119	91	23	5	86.1
Georgian Bay.....	118	85	18	15	79.7
Ottawa Valley.....	101	77	15	9	83.7
Upper St. Lawrence.....	101	74	18	9	82.2
Lower St. Lawrence.....	103	70	27	6	81.1
Gulf.....	106	75	17	14	78.8
Maritime Provinces, West.....	112	84	20	8	83.7
Maritime Provinces, East.....	112	78	23	11	79.9
Total.....	1,061	778	190	93	82.2

FORECASTS ISSUED AT VICTORIA, BRITISH COLUMBIA.

DISTRICTS.	No. Issued.	VERIFIED.			Percentage.
		No. Fully.	No. Partly.	No. Not.	
Victoria and vicinity.....	117	91	9	17	81.6
Lower Mainland.....	109	85	14	10	84.4
Total.....	226	176	23	27	82.9

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. E. STUPART,
Director.

Meteorological Office, Toronto,
26th June, 1903.

MONTHLY and Annual Summaries for the Year 1902-3, Fort Chipewyan, North-west Territories—Latitude,
N. 58° 42'; Longitude, W. 110° 10'. Height above Sea, — feet.

MONTH.	PRESSURE AT 30".			TEMPERATURE.									RELATIVE HUMIDITY.	PRESSURE OF VAPOUR.				CLOUD- NESS.	PRECIPITATION.	
	Monthly Mean.	Extremes.		Mean.					Extremes.		a.m. p.m. p.m. Mean.	a.m. p.m. p.m. Mean.	a.m. p.m. p.m. Mean.	a.m. p.m. p.m. Mean.	a.m. p.m. p.m. Mean.	Total.	Maximum in any 24 hours.			
		Max.	Min.	a.m.	p.m.	p.m.	Max.	Min.	a.m. p.m. p.m. Mean.											
		in.	in.				in.	in.		in.								in.	in.	in.
January, 1903	29.118	29.69	28.35	9.4	5.6	9.2	1.5	18.6	8.6	38.0	49.0					56.47	10.48	1.40	0.80	
February "	29.156	29.86	28.00	5.9	3.0	1.7	9.8	10.3	0.2	39.0	48.0					63.69	56.63	0.80	0.80	
March "	29.257	29.75	28.45	2.2	12.4	6.6	17.0	5.3	5.8	38.0	35.0					68.63	39.56	0.33	0.15	
April "	29.200	29.70	28.27	20.5	29.4	24.8	33.7	13.9	23.8	48.0	45.0					66.53	57.59	1.30	0.60	
May "	29.116	29.66	28.68	34.7	43.2	2.41	1.48	5.28	0.38	2	71.0	3.0					54.55	51.53	2.08	1.00
June, 1902	29.202	29.59	28.93	49.5	55.2	52.9	58.8	40.0	49.4	77.0	28.0					59.57	58.58	1.76	0.94	
July "	29.040	29.45	28.71	62.2	68.5	5.66	1.72	1.53	2.62	8	85.0	39.0					58.53	59.51	1.63	0.95
August "	28.987	29.35	28.47	59.5	64.1	1.59	1.67	5.48	9.58	2	77.0	33.0					52.63	61.59	4.43	1.75
September "	29.029	29.48	28.72	43.7	50.0	0.44	8.52	8.35	3.41	0	68.0	17.0					78.71	64.71	0.57	0.25
October "	29.056	29.50	28.51	36.6	42.5	5.37	2.44	5.30	3.37	4	63.0	23.0					56.62	43.54	0.48	0.20
November "	29.034	29.69	28.41	6.3	11.3	3.8	1.15	4.1	1.5	7.0	37.0	28.0					66.64	63.64	1.18	0.30
December "	29.189	29.91	28.43	4.0	2.6	4.1	3.6	11.1	1.3	8	37.0	30.0					55.50	41.50	1.10	0.50
Year..	29.115	29.91	28.00	24.7	31.0	0.27	4.35	5.16	9.26	2	85.0	48.0					61.59	52.57	17.06	1.75

MONTH	NUMBER OF WINDS FROM											Maximum Force.	Direction at time of Maximum Force.	No. of Gales.	NUMBER OF DAYS											Average.
															Clear.	Partly Cloudy.	Cloudy.	Precipitation 30 in. or over.	Snow.	Hail.	Fair.	Fog.	Thunder Storms.	Lightning Alone.		
	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.	Average Hourly Force.																
January, 1903	2	34	4	5	3	2	6	17	20	11	VI	W.	2	12	10	9	4	7	0	24				0		
February "	5	6	12	10	0	14	5	12	20	11	VII	S.W.	1	6	11	11	2	3	0	25				2		
March "	12	17	4	9	1	12	4	17	17	11	V	N.W.	2	7	13	11	4	7	0	24				4		
April "	5	21	15	5	2	9	1	8	24	11	IV	N.E.	0	8	9	13	4	4	0	26				0		
May "	5	27	32	7	0	4	2	3	10	11	VI	N.E.	4	8	13	10	4	4	0	25				0		
June, 1902	5	27	22	5	1	4	1	13	12	11	IV	N.E.	0	7	9	14	3	1	0	26				0		
July "	3	25	17	4	3	19	8	10	4	11	VI	N.E.	2	7	16	8	6	0	0	20				0		
August "	5	7	7	9	1	22	10	14	18	11	VI	N.W.	3	7	15	9	9	0	0	21				0		
September "	4	7	6	13	0	11	17	13	19	11	V	E.	1	3	14	13	5	2	0	20				0		
October "	5	6	12	19	3	19	9	6	14	11	VII	N	3	11	10	10	5	4	0	25				0		
November "	10	1	10	10	4	9	7	22	17	11	V	S.	1	2	19	9	8	9	0	21				0		
December "	7	5	6	13	2	9	9	12	30	11	VII	S.E.	2	10	12	9	3	5	0	26				0		
Year	68	183	147	109	20	134	79	147	205	11	VII	S.W. S.E.	21	88	151	126	57	46	0	283				3		

REPORT ON THE COUNTRY AROUND CHIPEWYAN AND PEACE RIVER FROM AN AGRICULTURAL POINT OF VIEW.

The immediate surroundings of Chipewyan is entirely composed of lakes, swamp and rocks. Though there is everything against the proper maturity of cereals, yet I believe a sample of wheat grown by the Roman Catholic Mission in this place obtained great credit at the World's Fair, Chicago.

We put in potatoes at the end of May. To day, June 3rd, I have got mine in, the snow and ice still to be seen on the hills and lake. By the end of September the potatoes will be ripe, and second to no potatoes in Canada, if we have rain sufficient. The nights are so short that there is a continual growth.

The true agricultural country is about 40 miles distant, and from there west along the Peace River as far as the Rocky Mountains wheat, barley, oats and roots may be grown of the best quality. The soil is very rich, so much so that those who are engaged in agriculture scarcely ever put manure on the land. At only one or two points along the entire Peace River is agriculture carried on, though it has been found successful from Peace Point, 40 miles from Lake Athabasca, right up to the Rockies.

At Vermillion, about 300 miles west of here, I lived for a number of years. Grain can be raised of the best quality; in fact Ontario farmers settled there say they have never seen better grain. I have seen all kinds of garden produce such as peas, turnips and potatoes larger and finer than I remember in England. Tomatoes and such like I do not know about.

Vermillion has four large roller mills and the Hudson's Bay Co. have got a very good one, and they believe they will be able to meet all the wants of the whole north in the way of flour. In fact all along the Peace River it is the same. There are thousands of good farms available, or, rather possible, for the country is yet in the hands of the trappers.

The prairies are well covered with good grasses and pea vine, so that hay can be made in great quantity. There is abundance of good timber, chiefly pine and spruce, with a good deal of poplar and birch. There are no fruits except wild berries of which there is an abundance - raspberries, service berries or saskatoon berry, choke cherries, strawberry, cranberry, blueberry and gooseberry; also black and red currants.

The rivers and lakes are well stocked with good fish, and the bush is full of rabbits, moose, deer, and also fur bearing animals.

At Chipewyan during April and May and again in September, October and half of November, geese and ducks are very numerous, stopping on their way between the north and south. Prairie chicken also abound.

From a mineral point of view the country is full of gas springs, tur springs, coal, iron, feldspar, &c. In fact the country is undoubtedly capable of affording support to an immense population. Already I hear hundreds of people are making their way to the Upper Peace River and taking up claims for farming and ranching.

A. J. WARWICK.

DEPARTMENT OF MARINE AND FISHERIES, CANADA.

METEOROLOGICAL SERVICE.

Monthly Weather Review.

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No. 6.

INTRODUCTION

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the material used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

REMARKS UPON THE WEATHER.

The weather of June over the Lower Mainland and Islands of British Columbia was mostly fine during the first eleven days, after which it became unsettled; and although it was fine about the 18th to 21st and 28th and 29th, the sky was generally overcast and showers were frequent up to the last day of the month. On or about the 8th, the weather was exceedingly warm in most districts and high temperatures were frequent up to the 18th when somewhat cooler conditions prevailed. Over the Upper Mainland the weather in most districts was similar to that further westward, clouded skies with occasional rain occurring frequently after the 11th, and high temperatures being recorded from about the 7th to 18th.

In the North-west Territories the weather was somewhat warm and although showers occurred quite frequently the total rainfall was small. Much bright sunshine prevailed, more especially during the first twelve days. Light frosts were recorded in a few districts, but little damage was caused thereby and the condition of vegetation was quite favourable on the 30th.

In Manitoba the weather was quite warm during the first six days, after which it was comparatively cool until the 23rd when warm weather again set in. There was comparatively little rain until after the 18th and the aggregate amount was small. In many districts light frosts were recorded but they do not appear to have caused any damage to vegetation, drought, however, affected plant life and its condition on the 30th was not very favourable.

The chief characteristics of the weather of Ontario were absence of bright sunshine and much rain after the first week; also low temperatures after the first ten days. Up to the 7th, although the sky was hidden in most localities by smoke from forest fires, the weather was fine. On or about this date showers occurred and continued intermittently to the 26th when the weather became somewhat finer. Thunderstorms were reported from a few places, they being more general on the 8th, 12th and 23rd, but little damage appears to have been caused thereby. In western districts vegetation was in excellent condition, but in the eastern portion of the Province it was somewhat backward.

In the Province of Quebec the weather continued fine and dry up to about the 10th when the long drouth was broken, rain occurring frequently at most places on and after that date. Much cloudiness after the 10th also characterized the weather of June in this Province. Light frosts were recorded at a few places and low temperatures at night were frequent; and although vegetation was much assisted by the copious rains it was still quite backward on the 30th.

The weather in New Brunswick was generally fine and warm up to the 6th when the sky became overcast and little sunshine was seen again until the 20th, showers occurring occasionally up to this date. From the 20th to 30th somewhat brighter weather prevailed, but showers were recorded at most places on or about the 26th, 27th and 28th. Absence of bright sunshine, light rainfall, and somewhat low temperatures retarded vegetation, it being quite backward on the 30th.

In Nova Scotia dull cool weather with little precipitation were the prevailing conditions in most districts, nevertheless there was some fine bright weather between the 1st and 6th, also upon several days after the 19th. On the 30th vegetation was backward throughout the Province.

The weather conditions in Prince Edward Island were very similar to conditions in New Brunswick, absence of sunshine after the 7th, low temperatures and little rain until the 26th being general. Frosts were recorded at many places during the first week but they do not appear to have caused any damage. Vegetation improved considerably after the rain of the 26th but it was still quite backward on the 30th.—F. F. PAYNE.

ATMOSPHERIC PRESSURE.

In the western portion of British Columbia and over the greater part of Ontario the mean atmospheric pressure for June was subnormal, elsewhere it exceeded the average. The range of departure was 0.23 of an inch; the extremes being +0.18 of an inch at Anticosti, Que., and -0.05 of an inch at Parry Sound, Ont. At Sydney, N.S., the maximum mean barometer, 30.105 inches occurred; the minimum 29.835 inches being reported from Kamloops, B.C.

HIGH AREAS.

Six areas of high pressure were considered of sufficient importance to be traced, but, with the exception of No. 1, none of them were very pronounced or of very rapid movement. Nos. 3 and 4, owing to their prolonged existence over the Gulf and Newfoundland affected the weather in Eastern Canada to a considerable extent.

No. 1 was centered to the north of the Great Lakes from the 1st to the morning of the 4th, when it moved quickly south-eastward and was centred on the Atlantic off Nantucket on the evening of the 4th, it then passed gradually north-eastward, disappearing to the south of Newfoundland on the 9th. While this area was north of the Great Lakes the weather remained remarkably fine from Manitoba to the Atlantic, no rain being reported east of the Lakes from the 1st to the 6th. No. 2 hovered in the neighbourhood of Oregon and the British Columbian Coast from the 4th to the 7th, when it moved eastward slowly across the Territories, being centred over Manitoba on the 10th. The area then passed southwards and dispersed over Arkansas on the 15th. Between the 11th and 13th it caused north-easterly and northerly winds and cool weather over the greater portion of Ontario, but as it drew south and dispersed the temperatures rose again; it also caused low night temperatures from the 7th to the 10th and quite cool weather on the 8th and 9th in the Territories. No. 3 was an area of minor importance which hovered over Newfoundland and the Gulf of St. Lawrence from the 11th to the 19th when it united with No. 4; between these dates the winds in the Gulf and Maritime Provinces were from an easterly direction. No. 4 hovered over the northern portion of the Territories from the 12th to the 14th, when it moved southwards and was situated south of Manitoba on the 16th, thence it passed south of the Lakes and eventually united with No. 3 over the Gulf, on the 19th. The combined system hovered over the Gulf Region till the 25th, when it disappeared. No. 5 was present over British Columbia on the 19th and 20th, it then moved on the 21st in a south-easterly direction to Nebraska, where it broke up into two areas, one of which dispersed over Manitoba on the 23rd, and the other over Missouri on the same date. This system was only of minor importance but caused some low night temperatures in the Territories on the 20th. No. 6 first appeared over British Columbia on the 23rd, whence it moved south-eastward and then north-eastward arriving over Lake Superior on the 26th, it then again slowly receded south-eastward and disappeared over the Atlantic north of Bermuda. On the 25th it brought clearing weather to Ontario after a prolonged rainy period.

LOW AREAS.

Eleven areas of low pressure were charted during June. Nos. 1, 3, 5, 6 and 10 originated in the far North-west Territories and States and moved in an easterly course; Nos. 7, 9 and 11 formed over the South-west States and travelled north-eastward over the Lakes. No. 2 developed over the Gulf States on the 5th and passing northward was absorbed by No. 1 while over Lake Huron. No. 4 was the most noteworthy of the month's depressions. It formed over the South Atlantic States during the 10th and moved northward to New York rapidly gaining energy, thence passing inland it entered Ontario from the St. Lawrence Valley on the 12th, circled westward gradually losing energy and crossed Lake Erie on the 13th. It then assumed the normal course and passed out to sea on the 15th. Strong winds and heavy rainfalls occurred in Ontario and Quebec during the presence of this area, also, in the Maritime Provinces, as it passed eastward after its erratic course. No. 8 was a subsidiary of No. 7 and formed over the South Atlantic States on the 23rd, when it moved north-eastward and was absorbed by No. 7 on the 26th, while over the Maritime Provinces. The first general warm wave occurred in Ontario on the 30th as No. 10 passed eastward to the north of the Lake Region.

WINDS.

On Vancouver Island and over the mainland of British Columbia the direction favoured somewhat the south and west although variable winds often obtained. Fresh breezes were recorded on sixteen days and strong winds on two or three occasions but the force of a moderate gale was hardly attained.

In the North-west Territories the south and west directions were the most general. The wind mileage was not excessive, there being no gales; on seven days the force of a strong wind was reached, and on thirteen days that of a fresh breeze.

In Manitoba the direction was variable and there were many days of light to moderate winds. On four occasions strong breezes were recorded, and on ten days the force of a fresh wind.

In the Lake Region the direction was variable and the force very often only light or moderate. On four occasions strong breezes prevailed, and on five, fresh, while between the 23rd and 24th the force of a moderate gale was locally experienced.

In the Ottawa and St. Lawrence Valleys the direction was also variable. There were thirteen days with fresh and three with strong breezes and there was one moderate local gale occurring between the 12th and 13th.

In the Gulf of St. Lawrence the easterly direction was the most general and on six occasions a strong and on twelve a fresh breeze was recorded.

In the Maritime Provinces the south and east directions were most in evidence. There were four days with strong and fourteen with fresh breezes.

No storm warnings were issued during the month.

TEMPERATURE.

The mean temperature of June was higher than the average in British Columbia, the North-west Territories and Manitoba, and below average from the Great Lakes to the Maritime Provinces. The largest positive departure from average amounted to about 3° near the Pacific Coast and in Northern Alberta and Saskatchewan and the largest negative departure to 6° in Cape Breton. The temperature was from 1 to 4 degrees below average over the larger portions of Ontario, Quebec and the Maritime Provinces.

The Highest and Lowest temperatures in each Province during June, 1903, were:

British Columbia,	99°·2 on 8th at Alberni.	32°·0 on 2nd at Ladner.
North-west Territories,	89°·5 on 16th at Didsbury.	23°·0 on 10th at Regina.
Manitoba,	92°·0 on 26th at St. Albans.	29°·0 on 10th at Bowsman.
Ontario,	{ 90°·0 on 6th at North Gower. 90°·0 on 30th at Stony Creek.	{ 27°·0 on 29th at White River.
Quebec,	87°·5 on 8th at Richmond.	29°·0 on 5th at Anticosti, S.W.P.
New Brunswick,	79°·2 on 6th at Moncton.	27°·5 on 4th at Sussex.
Nova Scotia,	89°·0 on 3rd at Bridgetown.	25°·8 on 5th at Parrsboro.
Prince Edward Island,	76°·6 on 11th at Charlottetown.	32°·1 on 5th at Charlottetown.

PRECIPITATION.

The most marked feature of the June rainfall was the excessive quantity in Eastern Ontario and Western Quebec, where from five to seven inches fell. The extreme south-western districts of Nova Scotia and New Brunswick also showed an excess, but in all other portions of the Dominion there was a deficiency, and in Manitoba and the more southern portions of the Territories the rainfall was decidedly scant; stations in Southern and Eastern Manitoba, in but few instances, report more than an inch, and at Medicine Hat, in Western Assiniboia, there were but a few light sprinkles.

BRIGHT SUNSHINE.

The amount of bright sunshine recorded in June was in excess of the average over the mainland of British Columbia and in the North-west Territories and Manitoba; elsewhere it was deficient. The extremes registered were 66 per cent. at Battleford, N.W.T., and 22 per cent. at Quebec City, Que. The departures from normal ranged from -22 per cent. at Fredericton, N.B., to +15 per cent. at Battleford, N.W.T.

PRECIPITATION AT STATIONS REPORTING RAIN, WEATHER, &c., DURING
JUNE, 1903.

STATIONS	RAINFALL.				Date.	SNOWFALL.				REMARKS.
	Amount in inches.	No. of Days of or Over.	No. of Fair Days.	Heaviest Fall in Month		Amount in inches.	No. of Days.	Heaviest Fall in Month	Date.	
BRITISH COLUMBIA	in.			in.		in.		in.		
Nanaimo City	2.63	10	20	0.80	12, 13					19th, thunder.
Kuper Island	2.94	10	20	1.19	24					19th, thunder.
Sooke Lake	2.10	8	22	0.84	24					
Goldstream Lake	2.05	13	17	0.54	24					
Copitlam	3.99	10	20	1.32	30					22nd, thunder.
Royal Oak	1.08	9	21	0.28	26					
Port Eslington	2.87	14	16	0.62	26					
Nas Harbour	1.61	8	22	0.63	25					
N. W. TERRITORIES—										
Weyburn	1.93	4	26	1.24	30					18th, thunderstorm.
Gleichen	0.87	8	22	0.24	17					17th, thunderstorm, 86° in
Lacombe	3.32	9	21	0.94	22					(shade.
Willow Bunch	0.83	6	24	0.39	26					10th, frost, 19, 30, thunder.
Beaver Hills E.	4.94	6	24	3.00	23					9th, frost; 18th, thunder.
Coutts	1.02	1	29	1.02	23					
Broodermum	2.22	11	19	0.69	23					18th, thunder.
Innisfail	3.27	8	22	1.27	27					
Stirling	0.90	3	27	0.50	14					
Strathcona	5.13	10	20	2.60	23					3, 4, 18, 19, 21, 27, 29, thun-
Regina	1.36	7	23	0.84	18					2nd, 18th thunder. (der.
Salcoats	0.82	6	24	0.24	30					
Victoria	2.59	10	21	0.64	23					26th, 27th, thunder.
MANITOBA—										
Gretna	1.92	8	20	0.70	27					
Oak Lake	1.13	3	27	0.71	30					
Morden	1.46	5	25	0.50	19					21st, thunder.
Belmont	0.80	8	22	0.25	30					5th, thunder.
Rathwell	0.98	6	20	0.34	9					21st, thunder and hail.
Cartwright	0.84	7	23	0.25	26					
Rapid City	1.10	3	26	0.75	30					
Norquay	1.23	9	21	0.25	20					
Beaver	1.04	5	25	0.47	19					
Oakdale Park	1.04	5	25	0.47	31					5th, thunder.
ONTARIO—										
N. Williamsburg	4.99	9	21	2.40	11					
Ennisville	4.35	7	23	1.85	22					
Westminster	5.26	11	19	2.01	7					9th, 16th, thunder.
Wooler	5.39	12	18	2.13	23					
Lynedoch	2.67	8	22	0.83	22					
Port Burwell	3.56	13	17	1.85	24					9th, thunder.
Croydon	0.65	7	23	1.90	23					23rd, 24th, thunder.
Scarboro'	3.15	9	16	1.06	23					6th, 29th, thunder.
Wharton	3.08	10	20	0.89	22					
Leas Hall	2.59	7	23	1.20	23					16th, thunder.
Amherst	5.00	13	17	2.29	24					
Dutton	1.58	5	22	0.95	22					28th, thunder.
Providence Bay	3.23	8	22	1.00	23					7, 8, 9, 16, 20, 21, 28, 29,
Ursa	4.50	13	17	1.25	22					[30, thunder.
Cayuga	3.11	9	21	1.00	22					
Deer Park	3.26	11	19	1.13	23					7th, 9th, 24th, thunder.
Westport	5.43	12	18	1.50	23					18th, 22nd, thunder.
Dealtown	3.74	11	19	1.42	22					
Oliver's Ferry	6.36	13	17	2.26	12					
Montague	6.54	10	20	2.66	12					
Huntsville	3.37	10	20	1.11	23					
Nottawasaga	2.70	3	27	1.50	12					7th, 9th, 19th, thunder.
Wyoming	2.83	9	21	0.50	23					8th, thunder.
Sunshine	2.69	8	22	0.77	23					
Orangeville	3.57	11	19	1.51	23					
Watford	4.26	11	19	1.50	23					14th, 17th, 25th, thunder.
Arden	4.81	15	15	1.19	24					16th, 23rd, thunder.
Embsdale	2.30	13	17	1.09	24					
Palma	5.30	12	18	1.47	13					16th, 23rd, 24th, thunder.
Georgetown	4.22	14	15	1.14	23					
Uxbridge	3.99	14	16	1.31	23					8th, 29th, thunder.
Smith's Falls	6.22	10	20	2.49	13					
Lansdowne	2.94	6	24	1.30	12					12th, 15th, 29th, thunder.
Jermyn	2.33	10	20	2.30	23					
Midland	2.35	11	19	0.67	25					
Godfrich	3.60	7	23	1.00	22					
NEW BRUNSWICK										
Point Esquimaux	1.59	6	24	0.92	26					
NOVA SCOTIA										
Port Mouch	0.55	4	26	0.34	30					

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE
SUN WAS ABOVE THE HORIZON IN THE MONTH OF JUNE, 1903.

Hours Ending

	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.
Victoria		0.13	0.21	0.35	0.40	0.46	0.50	0.63	0.56	0.55	0.54	0.52	0.43	0.37	0.15	0.00
Nanaimo	0.01	0.21	0.34	0.39	0.43	0.45	0.51	0.48	0.44	0.50	0.55	0.45	0.48	0.41	0.32	0.04
Agassiz		0.00	0.08	0.25	0.38	0.54	0.57	0.56	0.55	0.55	0.50	0.51	0.45	0.27	0.11	0.00
Battleford	0.60	0.71	0.75	0.73	0.79	0.84	0.83	0.74	0.79	0.73	0.70	0.68	0.64	0.55	0.34	0.08
Indian Head	0.08	0.35	0.63	0.63	0.63	0.65	0.71	0.70	0.65	0.64	0.58	0.55	0.53	0.28	0.01	
Brandon	0.00	0.25	0.61	0.72	0.74	0.79	0.78	0.75	0.70	0.61	0.50	0.45	0.28	0.02	0.00	
Winnipeg	0.10	0.51	0.57	0.61	0.63	0.68	0.72	0.75	0.70	0.70	0.77	0.72	0.65	0.60	0.11	
Woodstock	0.06	0.41	0.55	0.60	0.66	0.69	0.64	0.59	0.62	0.64	0.55	0.44	0.37	0.23	0.02	
Toronto	0.12	0.44	0.49	0.54	0.58	0.59	0.56	0.62	0.57	0.57	0.55	0.52	0.42	0.50	0.00	
Lindsay	0.06	0.28	0.41	0.51	0.50	0.54	0.49	0.50	0.55	0.57	0.51	0.40	0.34	0.29	0.13	
Barrie																
Gravenhurst	0.32	0.46	0.58	0.65	0.59	0.58	0.60	0.56	0.53	0.60	0.56	0.56	0.51	0.26	0.00	
Kingston	0.03	0.26	0.37	0.38	0.46	0.46	0.47	0.57	0.65	0.57	0.58	0.55	0.47	0.27		
Ottawa	0.06	0.19	0.33	0.41	0.45	0.40	0.46	0.50	0.48	0.48	0.52	0.56	0.75	0.68	0.00	
Montreal	0.07	0.27	0.39	0.48	0.48	0.49	0.45	0.52	0.53	0.51	0.47	0.33	0.19	0.04	0.00	
Quebec	0.06	0.22	0.28	0.33	0.34	0.42	0.45	0.35	0.34	0.25	0.17	0.14	0.10	0.02	0.00	
Fredericton	0.06	0.22	0.26	0.36	0.32	0.39	0.41	0.42	0.40	0.39	0.23	0.24	0.23	0.10	0.00	

	Victoria	Nanaimo	Agassiz	Battleford	Indian Head	Brandon	Winnipeg	Woodstock	Toronto	Lindsay	Barrie	Gravenhurst	Kingston	Ottawa	Montreal	Quebec	Fredericton
Mean proportion for month (Constant sunshine being 1.0)	0.36	0.37	0.33	0.66	0.46	0.48	0.54	0.45	0.44	0.39		0.50	0.35	0.34	0.28	0.22	0.25
Difference from average	0.06	—	0.02	0.15	0.04	0.03	0.01	0.08	0.13	0.15		0.19	—	0.15		0.22	
Maximum daily amount	0.81	0.30	0.77	0.98	0.76	0.76	0.84	0.91	0.84	0.87		0.96	0.81	0.81	0.93	0.83	0.76
Date	7-8	8	8	16	22	21	21	1	26	26		27	27	27	28	28	28
No. of days completely clouded	3	3	8	3	2	3	3	3	2	4		0	2	6	2	9	10

Aurora recorded :—

Where the class of aurora is noted by the observer, it is given, (I) being the brightest, (IV) the feeblest in brilliancy.

1. Aweme, II : Melfort, Manor.
2. Sussex, Melfort, Manor.
8. Bruce Mines, IV.
16. Estevan, IV.
17. Rat Portage, IV : White River, II.
18. Rat Portage, IV.
21. Aweme, III.
23. Estevan, III.
25. Estevan, IV.
26. Estevan, IV.
27. Aweme, III.

Thunder recorded on :—

1. Princeton.
2. Pilot Bay, Regina.
3. Threehills Creek, Bon Accord, Gatesgarth, Moose Jaw, Strathcona, Swift Current, Qu'Appelle, Gray Hill.
4. Bon Accord, Strathcona, Qu'Appelle.
5. Rat Portage, Almasippi, Aweme, Belmont.
6. London, Rat Portage, Birnam, Wetaskiwin, Estevan, Stony Mountain.
7. London, Point Clark, Birnam, Erasmus, Brantford, Sarnia, Welland, Melfort, Ursa, Westport, Wyoming, Port Stanley.
8. Bala, Otonabee, Sutton, North Gower, Shawinigan Falls, Ursa, Sunshine, Smith's Falls, Winnipeg, St. John, Haileybury.
9. London, Toronto, Port Hope, Beatrice, Clontarf, Bala, Otonabee, Ridgetown, Birnam, Erasmus, Bloomfield, Belleville, Wooler, Croydon, Ursa, Westport, Wyoming, St. Agathe, White River.
10. Sutton, Chicoutimi, Bullion, St. Agathe, Father Point, Barkerville, Quebec, Yarmouth.
11. Nicola, Quebec.
12. Quesnel, Spence's Bridge, Nicola Lake, Tobacco Plains (violent), Bullion, Pilot Bay, Jermyn, Barkerville, Grand Manan, Peterboro.
13. Princeton, Crane Lake, Medicine Hat, Kingston, Banff.
14. Bala, Arden, Swift Current.
16. Nanaimo, Port Stanley, Lindsay, Calvin, Otonabee, Quesnel, Garry Point, Spence's Bridge, Princeton, Vancouver, Nicola Lake, N. Nicomen, Clayoquot, Ursa, Emsdale, Georgetown, Haileybury.
17. Cranbrook, W. Kootenay, Threehills Creek, New Hope, Arden, Gleichen, Banff, New Westminster.
18. St. Agathe, Montreal, Medicine Hat, Swift Current, Port Stanley, Qu'Appelle, Ridgetown, Crane Lake, Melfort, Pincher Creek, Gatesgarth, Estevan, Moose Jaw, Dealtown, Weyburn, W. Beaver Hills, Bruderheim, Strathcona, Regina.
19. Calvin, Brome, Nicola Lake, N. Nicomen, W. Kootenay, Wetaskiwin, Estevan, Regina, Wyoming, Nanaimo, Kuper Island, Gray Hill.
20. Nicola Lake, Oakbank, Ursa, Quebec, New Westminster.
21. Rat Portage, Madoc, Ursa, Strathcona, Rathwell, Morden, Port Arthur, Parry Sound.
22. Sturgeon Falls, N. Nicomen, Dealtown, Coquitlam, Nanaimo, Gray Hill.
23. Gravenhurst, London, Bala, Ridgetown, Erasmus, Emsdale, Georgetown, Qu'Appelle.
24. Toronto, Haliburton, Clontarf, Bala, Madoc, Bloomfield, Belleville, Quesnel, Estevan, Westport, Georgetown, Kingston, Onion Lake.
25. Pietou, Truro, North Gower, Arden, Montreal, Halifax, Barkerville, Grand Manan, Yarmouth.
26. Pietou, Brome, Oakbank, Threehills Creek, Bon Accord, St. Agathe, Montreal, Grand Manan, Onion Lake, Victoria, (Alta.)
27. Pietou, Summerside, Bullion, Bon Accord, Strathcona, Charlottetown, Victoria, (Alta.)

28. Picton, Bullion, Almasippi, Aweme, Bowsman, Oakbank, Wetaskiwin, Providence Bay, Ursa, St. Johns.
 29. Lindsay, Meaford, Otonabee, Owen Sound, Brome, Quesnel, Bullion, Threehills Creek, Bon Accord, Ursa, Jernyn, Strathcona, Winnipeg, Battleford, Swift Current, Banff.
 30. Sturgeon Falls, London, Clontarf, Madoc, Chicoutimi, Wetaskiwin, Bon Accord, Gatesgarth, Moose Jaw, Ursa, Willow Bunch, Bruderheim, St. Agathe, Onion Lake.

FORECASTS FOR JUNE, 1903.

The forecasts issued by this office at 11 p.m. each night, are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of predictions issued during the month was 996. These were divided as follows:—

DISTRICT.	No. Issued.	VERIFIED.			Percentage
		No. Fully.	No. Partly.	No. Not.	
Manitoba	77	63	9	5	87.7
Lake Superior	99	87	8	4	91.9
Lower Lake Region	112	89	16	7	86.6
Georgian Bay	108	77	24	7	82.4
Ottawa Valley	95	79	10	6	88.4
Upper St. Lawrence	96	73	19	4	85.9
Lower St. Lawrence	101	82	13	6	87.6
Gulf	103	80	15	8	84.9
Maritime Provinces, West	103	74	21	8	82.0
Maritime Provinces, East	102	77	14	11	82.3
Total	996	781	149	66	85.9

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART,
Director.

Meteorological Office, Toronto,
 28th July, 1903.

DEPARTMENT OF MARINE AND FISHERIES, CANADA.

METEOROLOGICAL SERVICE.

Monthly Weather Review.

VOL. XXVII.

JULY, 1903.

No. 7.

INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the material used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

REMARKS UPON THE WEATHER.

The weather in Vancouver Island was generally dull, cool and wet up to the 6th, when fair weather set in and continued at most places up to the 23rd. On this latter date and on the 24th rain occurred, followed by fine weather during the remainder of the month. Over the Lower Mainland of British Columbia the rainy periods referred to above also occurred but they were more extended, nevertheless it was quite fine and dry from 8th to 21st, and with the exception of rain on or about the 30th it was fair from the 25th to 31st. Over the Upper Mainland rain was much more frequent than elsewhere, and although it was fine in many districts from the 11th to 22nd and 25th to 30th these conditions were not general. Throughout the Province the weather of the month was comparatively dull, cool and wet and vegetation was green and luxuriant.

In the North-west Territories the weather was somewhat dull and cool and in most districts there was much rain. The falls of rain varied considerably with the district both as to quantity and date but they were quite frequent, and at most places fair weather periods were short and there was comparatively little sunshine. Light frosts were recorded at a few places, but they do not appear to have caused much damage. Vegetation was generally quite backward on the 31st.

In Manitoba the weather conditions were somewhat similar to conditions in the Territories, but the rainfall was less and in some localities was below the average, and there was also more bright sunshine. On or about the 22nd and 23rd the temperature exceeded 90° at many places, 99° being recorded at St. Albans. Vegetation was normal on the 31st.

In Ontario the weather of July was typical of the season and varied considerably in contiguous districts: it was, however, somewhat cool and wet in most places in the southern portion and somewhat dry in the northern portion, excepting in Muskoka where it was also wet. In counties east of York bright sunshine was deficient, but elsewhere it was average or slightly above. Unsettled weather prevailed during the first four or five days, after which it was mostly fine until about the 12th, when it again became unsettled, rain and sunshine alternating until about the 22nd. After the latter date it continued fine and dry in most districts for five days, this dry period being followed by heavy rain on the 29th and 30th. Heavy thunderstorms occurred in most localities on the 1st, 4th, 9th, 19th and 29th, when standing grain was somewhat damaged. Vegetation was exceptionally luxuriant, more especially in the western portion of the Province.

The weather in the Province of Quebec although dry in the vicinity of Montreal, was generally dull, cool and wet elsewhere. During the first half of the month rain was less frequent than after the 14th, but showers occurred frequently in most districts throughout the month. Vegetation was backward and its condition was below normal on the 31st.

In New Brunswick the weather did not depart much from the normal, but it was somewhat dull, cool and wet in most districts. From the 4th to 10th, 17th to 20th and 28th to 31st it was mostly fair, showers occurring frequently during the intervening periods. Fogs were frequent near the coast and the proportion of bright sunshine was considerably below the average. Some damage to vegetation was caused by hail on the 27th, but the condition of plant life was about normal on the 31st.

The weather in Nova Scotia varied somewhat with the district but the departures from the normal were generally small: fogs, however, were unusually frequent and bright sunshine was quite deficient. The condition of vegetation was slightly below normal on the 31st.

In Prince Edward Island the weather was mostly fair during the first twelve days, although light showers were recorded on several occasions between the 1st and 5th. After the 12th it was more unsettled, rain occurring quite frequently. Bright sunshine was considerably below the average, but, with this exception, the departures from the normal were unimportant. An exceptionally heavy thunderstorm accompanied by hail occurred on the 26th. The condition of vegetation was somewhat below normal.—F. F. PAYNE.

ATMOSPHERIC PRESSURE.

The mean atmospheric pressure was above average west of Manitoba, the highest positive departure being .16 of an inch at Barkerville, B.C. East of Manitoba to the Atlantic the departures were negative, the differences being as much as minus .15 of an inch at Sable Island and .16 of an inch at St. John's, Newfoundland. Over South-western Ontario the pressure was very slightly below average.

HIGH AREAS.

During July eight areas of high pressure were sufficiently well marked to be traced. Seven of them were first observed when over the Plateau Region or North-west Territories, and one over Northern Ontario. The general path followed was south easterly and off the Middle and Lower Atlantic United States Coasts. No. 1 was a moderate area which, on the evening of the 2nd, was observed over Northern Ontario. It followed a south-easterly course and passed off the New England Coast during the 5th. No. 2 moved into the Pacific States during the 3rd and pursued a south easterly path to Oklahoma. It then passed north-eastward to Lake Erie on the 6th and afterwards drew away southward and off the Lower Atlantic Coast during the 9th. No. 3 was in a measure subsidiary to No. 2 and moved south-eastward from the Pacific States on the 7th, passing off the Lower Atlantic Coast on the 9th. No. 4 formed over the North-western States on the 10th and moved eastward across Manitoba, thence south eastward and off the Middle Atlantic Coast on the 16th. Nos. 5 and 6 followed similar courses to No. 3. No. 7 was first observed over the extreme Northern Territories on the 24th and followed a south-easterly course across Ontario; passing out to sea over the New England Coast on the 28th. No. 8 formed over the Territories on the 28th and moved east and south-east to Michigan where it was centered on the evening of the 31st.

None of these areas were of any great importance.

LOW AREAS.

Ten areas of low pressure have been charted for July, the majority of them having developed in narrow troughs of low pressure over the Plateau Region. A feature of the July lows was the persistency with which they hovered over the Gulf of St. Lawrence and the Maritime Provinces.

No. 1 moved from Lake Superior to the Gulf of St. Lawrence during the 1st and 2nd and was accompanied by fresh gales in the latter district. Nos. 2, 3, 5, and 8 were very moderate areas. No. 4 was the only depression of the month which did not affect Canadian weather, it having developed over Mexico and moved eastward and off the South Atlantic Coast. No. 6 developed in a trough of low pressure which covered the Plateau Region on the 14th, it moved eastward, passing south of the Lakes and then skirted the New England and Nova Scotian Coast during the 19th and 20th. It was accompanied by strong winds and local gales on the Lower Lakes on the 18th and by strong winds in the Maritime Provinces on the 19th. A small subsidiary followed this area across the Lakes to the New England Coast, causing a continuance of unsettled weather. No. 7 was a moderate area which moved eastward from British Columbia to the Maritime Provinces between the 18th and 24th. While hovering over the latter district, a marked subsidiary, No. 9, developed, and caused gales during the 27th in the Gulf of St. Lawrence and at our ocean ports, which in many localities were marked for their severity. No. 10 moved from the Western States to the Gulf of St. Lawrence between the 26th and 30th, accompanied by very strong breezes in the latter district. All of these areas, with the exception of No. 4, were accompanied in Canada by showers and thunderstorms throughout their course.

WINDS.

In Vancouver Island and over the Mainland of British Columbia the direction was chiefly between the south and west. The wind mileage was not very large, there being only two days of strong, breezes but on eighteen occasions there were fresh breezes.

In the North west Territories the direction favoured somewhat the south and west and there was a fair wind mileage, strong breezes being recorded on nine days and fresh on seventeen.

In Manitoba the south and west direction was most in evidence. There were two gales besides eight days of strong and thirteen of fresh breezes.

In the Lake Region the south and west directions chiefly prevailed. On three occasions the winds were strong, on fifteen fresh, and on the 18th the force of a moderate gale was locally attained, chiefly on Lakes Erie and Ontario.

In the Ottawa and St. Lawrence Valleys the south and west directions prevailed for twenty-five days of the month and there were six days of strong and twenty of fresh breezes.

In the Gulf of St. Lawrence the direction was slightly in favour of the south and west but there was also a large preponderance of easterly winds. There were fourteen days with fresh and two with strong breezes, as well as two gales of considerable strength occurring respectively on the 2nd and on the 27th, the latter storm being the heaviest.

In the Maritime Provinces the direction was almost entirely between the south and west. There were four days with strong and nine with fresh breezes, and one gale which occurred on the 27th.

The gale on the Lower Lakes on the 18th was warned, also the ports in the Gulf of St. Lawrence and Cape Breton for the gale of the 27th; otherwise no warnings were issued.

TEMPERATURE.

The temperature was below the average throughout Canada except at a few isolated places in the peninsula of Ontario where the average was either maintained or slightly exceeded. The negative departure was as much as 4 degrees in portions of Southern Alberta and Southern Assiniboia, and 3 degrees in many parts of British Columbia, but elsewhere from 1 to 2 degrees was the usual departure from the average.

The Highest and Lowest temperatures in each Province during July, 1903, were:

British Columbia,	97° 1 on 23rd at Tobacco Plains.	26° 7 on 1st at Stuart's Lake.
North-west Territories,	99° 0 on 31st at Melfort.	25° 0 on 16th at Alameda.
Manitoba,	99° 0 on 22nd at Aweme.	35° 5 on 31st at Winnipeg.
Ontario,	91° 6 on 8th at Haileybury.	30° 0 on 15th at Savanne.
Quebec,	92° 0 on 10th at Sherbrooke.	38° 0 on 23rd at Brome.
New Brunswick,	86° 0 on 2nd at St. Stephen.	38° 0 on 28th at Moncton.
Nova Scotia,	87° 1 on 11th at Halifax.	36° 0 on 29th at Truro.
Prince Edward Island,	83° 0 on 18th at Charlottetown.	42° 0 on 6th at Charlottetown.

PRECIPITATION.

The rainfall, generally, was above the average, and in many localities to a marked extent, but in certain small sections of the Dominion the fall was deficient. These sections with the negative departure were noticeably the western portion of the Province of Quebec, Prince Edward Island and Cape Breton as well as a few scattered points in Ontario, the North-west Territories and on the coast-line of British Columbia. Over the mainland of British Columbia the rainfall was much above the average and between the 4th and 6th there was a snowfall of about two feet on the mountain ranges, extending to quite a low altitude for the season of the year. Southern Alberta was remarkable for its large rainfall, so also was the Qu'Appelle Valley, but the largest positive departures were in the peninsula of Ontario, mainly no doubt attributable to heavy local thunderstorms. Port Dover was 5.9 inches above the average; Port Stanley 4.1 inches above; Owen Sound 3.3 inches above, and Toronto 1.4 inches above. The positive departure was also marked in the peninsula of Quebec, likewise in Northern New Brunswick and over the Island of Anticosti.

BRIGHT SUNSHINE.

The amount of bright sunshine recorded in July was deficient throughout Canada, with local exceptions in Ontario. The maximum amount registered was 61 at Toronto, Ont., and the minimum 34 at Fredericton, N.B. The extremes of departure from average were, +1 at Toronto, Ont., and -20 at Battleford, N.W.T.

PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, JULY, 1903.

a Barometer not reduced to Sea Level * Stations not furnished with Registering Thermometers.

STATION.	Latitude N.	Longitude W.	Elevation above sea level, in feet.	Pressure.			Temperature.			Humidity.			Direction of Wind from.			Velocity of Wind.			Precipitation.			No. of foggy days.	No. of thunder storms.	No. of fair days.	Days with 10 or more inches of rain.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
				Mean reduced.	Highest.	Lowest.	Range.	Mean.	Difference from average.	Years observed in.	Highest.	Lowest.	Date.	Mean daily range.	Mean temperature of dew point.	Mean relative humidity.	Mean amount of cloud.	No. of days completely clouded.	N.	N.E.	E.					S.E.	S.	S.W.	W.	N.W.	C.	Total number of hours.	Mean miles per hour.	Highest days velocity.	Date and direction.	Amount.	Difference from average.	Heaviest fall in month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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PRECIPITATION AT STATIONS REPORTING RAIN, WEATHER, &c., DURING
JULY, 1903.

STATIONS.	RAINFALL.				REMARKS.
	Amount in inches.	No. of Days of or Over.	No. of Fair Days, in Month	Heaviest Fall in Month	
	in.			in.	
BRITISH COLUMBIA					
Port Essington	2.41	12	19	0.49	25
Kuper Island	1.04	7	24	0.36	1
Goldstream Lake	0.73	7	24	0.41	1
Royal Oak	0.51	3	28	0.40	5
Nanaimo City	0.45	4	27	0.24	13
Sooke Lake	0.92	3	28	0.52	1
N. W. TERRITORIES—					
Regina	4.74	9	19	1.56	7
Victoria, Alberta	6.03	17	14	2.00	14
Willow Bunch	6.53	14	17	2.38	3
Stirling	1.22	5	26	1.02	31
Beaver Hills W.	1.78	17	14	1.71	14
Conits	1.12	8	23	0.81	31
Bruderheim	5.78	14	17	2.95	14-15
Dirt Hills	1.40	11	20	0.20	2
Innisfail	3.31	18	13	0.52	24
Foxleigh	4.84	15	16	1.22	3
Beaver Hills E	1.82	13	18	2.95	14-15
MANITOBA					
Rathwell	1.66	11	17	0.40	24
Lansdowne	0.96	6	24	0.38	27
Gretina	0.99	5	25	0.47	27
Norquay	1.19	10	19	0.38	1
Cartwright	1.33	9	21	0.65	26
Beaver	1.53	9	22	0.25	20
Rapid City	1.61	4	26	0.77	24
Belmont	1.44	9	22	0.56	27
Oakdale Park	1.50	7	24	0.60	2
ONTARIO—					
Westport	3.93	9	22	0.89	29
Providence Bay	2.80	13	18	0.71	29
Huntsville	3.18	9	22	1.14	29
N. Williamsburg	5.59	11	20	1.11	21
Arden	2.83	13	18	0.64	29
Goderich	2.40	7	24	0.80	28
Jermyn	3.61	8	23	1.03	29
Smith's Falls	4.18	11	20	2.24	23
Parnam	4.15	11	20	1.05	29
Wooler	2.54	8	23	0.83	29
Croydon	3.75	9	22	0.95	1
Emsdale	4.76	17	14	1.09	22
Georgetown	4.60	11	14	1.77	20
Midland	2.06	10	21	0.98	29
Uxbridge	6.07	15	16	1.21	19
Lynedoch	6.90	15	15	1.82	12
Port Burwell	8.52	12	19	2.69	21-22
Nottawasaga Island	2.80	5	26	1.00	14
Lion's Head	3.88	10	21	2.26	29
Aurora	4.18	13	18	0.96	19
Watford	7.44	9	22	2.90	10
Sunshine	2.68	11	20	0.59	30
Dutton	5.50	8	23	1.60	24
Oliver's Ferry	3.79	13	18	0.92	14
Emmimore	2.50	8	21	1.10	29
Deer Park	1.29	8	23	1.42	19
Wyoming	4.25	9	22	2.00	11
Ursa	3.92	13	18	0.89	28
Lansdowne	2.32	6	25	0.70	29
Westminster	7.88	11	20	2.73	11
Dealbown	7.26	12	19	1.83	17
Scarboro'	2.40	10	19	0.96	29
Warton	3.24	9	22	1.61	29
Cayuga	3.02	7	17	1.31	30
Montague	4.93	10	21	2.20	23
Orangeville	3.65	7	24	1.13	29
NEW BRUNSWICK					
Pome Escommac	3.61	11	20	0.68	24
NOVA SCOTIA					
Port Mouch	3.43	6	25	0.95	20

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE
SUN WAS ABOVE THE HORIZON IN THE MONTH OF JULY, 1903.

	HOURS ENDING.															
	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.
Victoria	0 00	0 05	0 41	0 53	0 65	0 68	0 65	0 74	0 84	0 76	0 82	0 79	0 72	0 63	0 31	0 00
Nanaimo	0 01	0 30	0 48	0 56	0 65	0 65	0 62	0 64	0 71	0 74	0 73	0 68	0 64	0 60	0 42	0 05
Agassiz	0 00	0 16	0 40	0 46	0 52	0 50	0 53	0 53	0 56	0 56	0 56	0 55	0 42	0 15	0 00	
Battleford	0 15	0 27	0 36	0 40	0 47	0 48	0 51	0 51	0 49	0 52	0 47	0 38	0 43	0 34	0 24	0 04
Indian Head	0 18	0 60	0 68	0 68	0 65	0 67	0 72	0 62	0 62	0 62	0 63	0 61	0 57	0 52	0 30	0 00
Brandon	0 02	0 47	0 65	0 74	0 70	0 74	0 78	0 75	0 78	0 78	0 78	0 72	0 55	0 54	0 42	0 01
Winnipeg	0 15	0 61	0 68	0 66	0 65	0 66	0 70	0 65	0 72	0 70	0 71	0 62	0 59	0 50	0 07	
Woodstock	0 15	0 49	0 59	0 72	0 74	0 72	0 78	0 85	0 83	0 82	0 79	0 66	0 62	0 31	0 00	
Toronto	0 19	0 53	0 63	0 68	0 78	0 81	0 82	0 76	0 72	0 76	0 68	0 60	0 54	0 05	0 00	
Lindsay	0 02	0 20	0 29	0 42	0 50	0 58	0 68	0 64	0 65	0 67	0 63	0 58	0 48	0 42	0 39	0 16
Barrie																
Gravenhurst	0 00	0 55	0 62	0 64	0 64	0 67	0 66	0 67	0 71	0 64	0 69	0 65	0 69	0 65	0 28	
Kingston	0 02	0 11	0 58	0 53	0 59	0 58	0 65	0 69	0 76	0 80	0 80	0 79	0 67	0 46	0 02	
Ottawa	0 00	0 15	0 46	0 52	0 52	0 51	0 65	0 72	0 70	0 72	0 65	0 67	0 58	0 45	0 19	0 00
Montreal	0 17	0 42	0 53	0 66	0 61	0 68	0 63	0 64	0 68	0 60	0 58	0 63	0 52	0 08	0 00	
Quebec	0 11	0 31	0 40	0 40	0 42	0 45	0 43	0 51	0 45	0 46	0 44	0 46	0 38	0 13	0 00	
Fredericton	0 08	0 29	0 34	0 38	0 46	0 48	0 50	0 52	0 44	0 45	0 39	0 31	0 25	0 16	0 00	
Mean proportion for month (Constant sunshine being 1.)	0 55	0 54	0 38	0 39	0 51	0 55	0 59	0 61	0 48		0 58	0 55	0 49	0 56	0 35	0 34
Difference from average.....	0 03	--	0 07	0 20	0 03	0 01	0 03	0 00	0 01	0 08		0 02	0 04	0 03		0 17
Maximum daily amount.....	0 84	0 92	0 77	0 89	0 84	0 82	0 82	0 86	0 90	0 95		0 89	0 83	0 81	0 96	0 80
Date.....	20	21	21	20	22	21	21	23	27	24		27	27	27	3	28
No. of days completely clouded..	0	1	5	1	2	2	2	0	0	2		0	0	1	2	4

Aurora recorded .—

Where the class of aurora is noted by the observer, it is given, (I) being the brightest, (IV) the feeblest in brilliancy.

16. Haileybury, IV.
25. Threehills Creek, III.
26. Haileybury, IV.
27. Haileybury, III ; Deseronto, IV ; Golden, Bruce Mines, III ; Quebec, IV.
28. Pictou, IV.

Thunder recorded on :—

1. Sturgeon Falls, Gravenhurst, London, Haileybury, Lindsay, Regina, Ursa, Willow Bunch, Huntsville, Providence Bay, Emsdale, Georgetown, Wyoming, Princeton, Gatesgarth, Bon Accord, Moose Jaw, Regina, Point Clark, Erasmus, Cloutarf, Bala, Stratford, Welland, Kinmount, Cockburn Island, Sherbrooke, Brantford, Port Dover, Bruce Mines, Owen Sound, Paris, Agincourt, Meaford, Quebec, White River, Montreal, Port Arthur, Qu'Appelle, Stony Creek.

2. St. Agathe, Truro, Beaver Hills W., Belmont, Arden, Westport, Georgetown, W. Kootenay, Bon Accord, St. Alban's, Bala, Sutton, Sydney, Grand Manan, Port Stanley, Kingston.

3. London, Beaver Hills E., Providence Bay, Nottawasaga Island, Aurora, Wiarton, W. Kootenay, Point Clark, Brantford, Owen Sound, Birnam, Bala, Stratford, Welland, Sarnia, Rocklyn, Clinton, Port Stanley, Saugeen, Toronto.

4. Gravenhurst, Beaver Hills E., Providence Bay, Ursa, Wiarton, Threehills Creek, Gleichen, Bon Accord, Moose Jaw, Point Clark, Erasmus, Port Dover, Clinton, Sutton, Cockburn Island.

5. London, Barnardo, Beaver Hills W., Wooler, Georgetown, Uxbridge, Lansdowne, Gatesgarth, Grenfell, Moose Jaw, Welland, Kinmount, White River, Parry Sound, Port Stanley, Minnedosa, Toronto.

6. Princeton, Gatesgarth, Brome, Medicine Hat, Minnedosa.

7. St. Agathe, Truro, Pictou, Barnardo, Regina, Rathwell, Estevan, Grenfell, Hillview, Bowsman, Rat Portage, Moncton, Father Point, Montreal, Medicine Hat, Qu'Appelle.

8. Truro, Pictou, Willow Bunch, Quesnel, Quebec.

9. Barnardo, Oakdale Park, Regina, Rathwell, Belmont, Providence Bay, Uxbridge, Scarboro, New Hope, Estevan, Gatesgarth, St. Alban's, Bruce Mines, Cockburn Island, Shawinigan Falls, Winnipeg, Toronto, Stony Creek, Stuart's Lake.

10. Truro, Pictou, Barnardo, Oakdale Park, Rathwell, Lansdowne, Tobacco Plains, Bullion, Quesnel, Sutton, North Gower, Sherbrooke, Brome, Percé, Cape Chatte, Quebec, Yarmouth, St. John, Winnipeg, Swift Current.

11. Truro, Sturgeon Falls, London, Haileybury, Emsdale, Scarboro, Bullion, Cranbrook, Princeton, Brantford, Port Dover, Bruce Mines, Birnam, Welland, Clinton, Charlottetown, Kamloops, Toronto, Port Stanley.

12. Pictou, London, Point Escuminac, Beaver Hills W., Summerside, Bullion, Princeton, Threehills Creek, Wetaskiwin, Gray Hill, Bon Accord, Paris, Welland, Moncton, Charlottetown, Quebec, Father Point, St. John, Banff.

13. Beaver Hills W., Bruderheim, Beaver Hills E., Ursa, Wetaskiwin, Bon Accord, Quebec, Barkerville, New Westminster.

14. Oakdale Park, Bruderheim, Wyoming, Ursa, Scarboro, Golden, New Hope, Moose Jaw, Chicoutimi, Quebec, Port Stanley, Qu'Appelle, Toronto, Swift Current.

15. Barnardo, Point Escuminac, Rathwell, Huntsville, Emsdale, Almasippi, Oakbank, Rat Portage, Sherbrooke, Shawinigan Falls, Brome, Percé, Moncton, Charlottetown, Parry Sound, Qu'Appelle, Winnipeg.

16. Point Escuminac, Sherbrooke, Percé, Quebec, Chatham, Dawson.

17. St. Agathe, Westport, Princeton, Wetaskiwin, Gray Hill, Bowsman, St. Stephen's, Nanaimo, St. John.

18. Truro, Pictou, Haileybury, Jermyn, Wyoming, Summerside, Threehills Creek, Didsbury, Onion Lake, Gleichen, Chicoutimi, Moncton, Charlottetown, Sydney, White River, Banff.

19. Sturgeon Falls, Gravenhurst, Oakdale Park, Regina, Beaver Hills W., Brudersheim, Jermyn, Emsdale, Georgetown, Midland, Nottawasaga Island, Lion's Head, Aurora, Wyoming, Scarborough, Estevan, Duck Lake, Bon Accord, Hillview, Erasmus, Bruce Mines, Bala, Lakefield, Lucknow, St. Catharines, North Gower, Cockburn Island, Haliburton, Owen Sound, Agincourt, Meaford, Birnam, Port Arthur, Parry Sound, Port Stanley, Medicine Hat, Toronto, Swift Current, Stony Creek.

20. Gravenhurst, Haileybury, Lindsay, Belmont, Westport, Emsdale, Georgetown, Aurora, Sunshine, Wyoming, Ursa, Scarborough, Wiarton, Oakbank, St. Albans, Port Dover, Bruce Mines, Agincourt, Clontarf, Bala, Lakefield, Lucknow, St. Catharines, Sutton, White River, Ottawa, Parry Sound, Port Stanley, Minnedosa.

21. St. Agathe, London, Beaver Hills W., Arden, Ursa, Westminster, Scarborough, Agincourt, Lucknow, St. Catharines, Sutton, North Gower, Ottawa, Port Stanley, Kingston, Toronto.

22. Deseronto, London, Lindsay, Belmont, Jermyn, Smith's Falls, Georgetown, Port Burwell, Ursa, Bullion, W. Kootenay, Quesnel, Princeton, Golden, Pincher Creek, Bon Accord, Brantford, Port Dover, Lakefield, Welland, North Gower, Shawngnan Falls, Prince Albert, Port Stanley, Banff, Kingston, Toronto.

23. Barnardo, Rivers Inlet, Willow Bunch, Coutts, Smith's Falls, Emsdale, Cranbrook, Pincher Creek, Gatesgarth, Bon Accord, Moose Jaw, Bowman, Clontarf, Sutton, Sherbrooke, Brone, Grand Manan, Ottawa, Banff, Kamloops.

24. Stony Mountain, Victoria (Alta.), Innisfail, Beaver Hills E., Quesnel, Gray Hill, Hillview, Oakbank, Rat Portage, Abitibi, Charlottetown, St. John, Prince Albert, Medicine Hat, Winnipeg.

25. Willow Bunch, Beaver Hills W., Brudersheim, Golden, Lethbridge, Bon Accord, Chicoutimi, Calgary.

26. Barnardo, Point Escuminac, Regina, Foxleigh, Beaver Hills E., Arden, Summerside, Hamilton, Bullion, W. Kootenay, Onion Lake, Duck Lake, Gray Hill, Gatesgarth, Bon Accord, Moose Jaw, Indian Head, Moncton, Pt. Lepreaux, Charlottetown, St. John, Medicine Hat, Banff, Qu'Appelle, Swift Current.

27. Belmont, Emsdale, Ursa, Melfort, Regina, Hillview, Rat Portage, Qu'Appelle, Minnedosa, Winnipeg, Swift Current.

28. Gravenhurst, Victoria (Alta.), Georgetown, Midland, Nottawasaga Island, Ursa, Wiarton, Bullion, Onion Lake, Hillview, Bruce Mines, Meaford, Beatrice, Lakefield, Lucknow, Welland, Kinmount, Winnipeg.

29. Deseronto, London, Lindsay, Coutts, Huntsville, Arden, Jermyn, Providence Bay, Georgetown, Midland, Uxbridge, Port Burwell, Lion's Head, Aurora, Escuminac, Lansdowne, Westminster, Scarborough, Wetaskiwin, Bon Accord, Erasmus, Birnam, Beatrice, Bala, Lucknow, Welland, Sarnia, Peterboro, Rocklyn, Brantford, Bruce Mines, Haliburton, Owen Sound, Paris, Agincourt, Birnam, Belleville, Clinton, Sutton, Quebec, Port Stanley, Saugeen, Medicine Hat, Kamloops, Winnipeg, Toronto.

30. Deseronto, Beaver Hills W., Jermyn, Wyoming, Brantford, Yarmouth, Calgary, Parry Sound, Port Stanley, Kamloops, Kingston.

31. Arden, Tobacco Plains, Chicoutimi.

FORECASTS FOR JULY, 1903.

The forecasts issued by this office at 11 p.m. each night, are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of predictions issued during the month was 1,200. These were divided as follows :—

DISTRICT.	No. Issued.	VERIFIED.			
		No. Fully	No. Partly	No. Not	Percentage
Manitoba.....	95	81	8	6	89.5
Lake Superior.....	116	90	17	9	84.9
Lower Lake Region.....	131	117	11	3	93.5
Georgian Bay.....	130	110	15	5	90.4
Ottawa Valley.....	120	105	6	9	90.0
Upper St. Lawrence.....	119	104	6	9	89.1
Lower St. Lawrence.....	124	105	11	8	89.1
Gulf.....	125	101	12	12	85.6
Maritime Provinces, West.....	120	99	14	7	88.3
Maritime Provinces, East.....	120	97	11	12	85.4
Total.....	1,200	1,009	111	80	84.7

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART,
Director.

Meteorological Office, Toronto,
26th August, 1903.

POSSIBILITIES OF AGRICULTURE IN UNORGANIZED DISTRICTS.

The following report has been received from Mr. C. H. M. Gordon, observer at Fort Hope, Lat. 51° 32' N.

As far as my own experience extends and what I can learn from previous observations made in the direction of agriculture it tends to show that the climate is good and the seasons long, but the soil is too poor for any successful effort, except with potatoes, and even that crop is often a failure. The soil here is nothing but red sand which extends to a great depth with only a very small layer of black earth on top. When new ground is broken the results for a few years are fair, but after a time it gets so mixed with the sand that our best efforts are fruitless.

There is no nutrition in the grass for cattle. Even in the best part of the season when we are not troubled with flies, the milk is poor and butter made from it white, and the cream is never yellow and rich.

For the last two years we were troubled in our vegetable garden, especially with a plague of grasshoppers. They eat up all our young plants and discourage all our efforts to obtain good vegetables. In fact, the Rev. E. Richards, who was a successful gardener at the last post he was stationed, has given up growing everything except potatoes.

Although around Fort Hope the soil is poor, yet down the river towards Marten's Falls the soil is splendid and at that post they grow everything in the way of vegetables, and very good results can be obtained by experienced farmers.

We have very fine timber along the lake, the wood being sound and of a good size. There is not much swampy ground; this commences some distance below Marten's Falls.

The following report has been received from Mr. J. K. McDonald, observer at York Factory, Lat. 57° 0' N.

Regarding cereals, &c., grass grows in a wild state and thrives principally below tide mark. Red currants grow wild, also as do strawberries. The latter, however, do not ripen as a rule till August 1st. Two years ago coming down here from Norway House no strawberries were seen on the portages though there were plenty of plants but their season was past. On arriving here on the 7th of August I had some barely ripe and ate them on for two weeks after. No vegetables are grown. Lettuce, however, I know matures. Thirty years ago we grew turnips but they were of a very small size. Potatoes grew some years then but never matured, being small and soft. After an absence of twenty-two years, I came here recently to find that the patch of ground formerly used as a garden had been allowed to run fallow for many years as it was so unproductive, nor have I considered it worth the expense to try and recultivate, much as we desire vegetables. From previous experience I did not think this worth while. Last summer a poplar tree which stood in the garden for forty years died, owing, I presume, to the continued cold weather of that summer. Cereals do not mature here.

The following report has been received from Mr. Stewart Cotter, observer at North-west River, Labrador, Lat

The district in which North-west River is situated is as favourable as any other locality in Labrador for agricultural purposes. The season is longer and much warmer than at Rigolet, ninety miles further down Hamilton Inlet where easterly winds and summer frosts are more prevalent. The ground is quite free from frost by the last week in May as a rule.

List of Roots and Vegetables, North-west River:—

BEANS, BROAD FRENCH.—These grow very well though not always of full size, but in good soil and favourable season there would be no difficulty in obtaining a good crop; sometimes get cut down by frost in spring. RUNNERS.—Tried several summers but only came to flower and grew about four or five feet high.

BEEF.—No trouble in its cultivation but they do not attain a large size, six to nine inches in length, two to three inches in diameter, very fine flavour, good and solid and keep good all winter, their growth not affected by frost.

CABBAGE.—Started in boxes in house and transplanted 15th or 20th June will grow to medium size, although the heads are never very solid, very delicate in flavour, grown everywhere on the Coast by settlers and Newfoundland fishermen, the latter sowing the seed in the open ground before returning home in the fall, not affected by frost and not to any extent by grubs. Red cabbage similar to the other.

CARROTS.—Carrot crop always a success and as large and the quality as good as I have seen on Lake Temiscamingue; keep good all winter.

CAULIFLOWER.—No difficulty in raising this vegetable but the heads are small—three inches to six inches in diameter.

CRESS.—Very easy of cultivation.

CUCUMBERS.—Local success under glass.

KOHLRABI.—Tried one season with fair success; about three inches in diameter.

LETTUCE.—Grows well and large and of good quality.

MUSTARD.—Very easy of cultivation.

ONIONS.—Do not thrive very well; tried several seasons from seed and by September were only half an inch in diameter. A practical gardener would no doubt be more successful. I do not think the soil was rich enough.

PARSLEY.—Very easy of cultivation.

PARSNIPS.—Do not grow as well as carrots though they are good and sound in quality.

PEAS.—Dwarf peas sown at intervals from first week in June to 10th or 15th July were very productive. I do not think the season is long enough for a crop to ripen thoroughly as when the cold weather sets in the plants, as a rule, are still green. Size and quality the same as at Temiscamingue.

POTATO.—I have tried four or five different varieties of seed from Quebec, Newfoundland, Prince Edward Island and the Old Country and all have succeeded equally well, the average yield being from eight to ten bushels from one bushel cut seed; that is, if the season has not been too cold or backward. The quantity or quality may not compare with those grown in a farming country, but in size they are equal. Though the quality is good enough they are inclined to be watery; this may be because they are not ripe, as the stalks never die down. It is more noticeable if the season has been unusually wet; at any rate they are not as solid as the imported article. The seed is planted the last week in May and the roots taken up about October 1st.

RAIISH.—Very easy of cultivation.

RHUBARB.—Grows the ordinary size and easy to cultivate.

TOMATO.—Tried several seasons but never came to flower; the season is probably too short for them to bear fruit in the open.

TURNIPS.—Are easy of cultivation and are on all parts of the coast, the white sorts attaining the largest size, good and solid and keep well.

GRASSES.

CLOVER.—Has never been tried, but would no doubt grow.

TIMOTHY.—A small quantity grows about North west River Post and is about one foot high.

LAWN GRASS SEED.—Was sown several seasons but did not come up.

CEREALS

WHEAT.—Has never been tried and I do not think would ripen.

OATS.—Have been grown though I am not positive if they reached maturity. It is quite probable, however, that this grain would succeed.

CORN.—I do not think that the climate is warm or the season long enough to grow corn. It has never been tried to my knowledge.

FRUIT.—No fruit of any description is grown in Hamilton Inlet or on any part of the Coast that I am aware of. There would be no difficulty in cultivating red or white currants, but I am certain no other sort would succeed.

FLOWERS.—Hardy varieties grow exceedingly well. Pansies, especially, attaining very large size. Stock, Poppy, Sweet William, Nasturtium and a great variety of others being as easy of cultivation as at Temiscamingue.

The soil in which these vegetables, &c., are grown is sandy and requires a lot of fertilizer to be productive. Rockweeds, seaweeds, &c., washed ashore by gales of wind answer this purpose in place of anything better. There are many places, however, in which the soil is better adapted for farming purposes, chiefly on the Hamilton and Kinnomow Rivers where it is composed of clay and sand or of a light black decomposed substance varying from six to twelve inches in depth laying on a subsoil of sand which, with the admixture of the latter, forms a good soil.

The best localities for farming would be on the Hamilton River or on any of the rivers flowing into the level of Hamilton Inlet, as the farther inland the warmer and earlier the season.

I have been impressed with the success of the Missionaries in their agricultural pursuit. At all their stations on the Coast, which are more or less exposed to the sea, they raise nearly all the vegetables mentioned in the list given, and grow a great variety of flowers besides. Of course, they go to a lot of trouble to guard against frost. From these observations, I am of the opinion that good results could be obtained from the soil in Hamilton Inlet under proper management, for it will be understood that there are no practical farmers there.

DEPARTMENT OF MARINE AND FISHERIES, CANADA.

METEOROLOGICAL SERVICE.

Monthly Weather Review.

VOL. XXVII.

AUGUST, 1903.

No. 8.

INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the material used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

REMARKS UPON THE WEATHER.

The weather of August over the islands and mainland of British Columbia was generally much cooler than the average, and remarkable for the unusual quantity of rain which fell over the greater portion of the Province: this was particularly noticeable in the dry belts, the ranges in the upper country which are usually brown and parched at this time of the year, being quite green. Bright sunshine was under the average and the wind mileage was also less than usual. At Agassiz rain was recorded on twenty-four days, at Quesnelle in the Cariboo country, on twelve days, and at Nicola Lake on sixteen days, and in many localities harvesting was much interfered with owing to the wet, the number and severity of the thunderstorms in the northern part of the province was exceptionally large.

In the North-west Territories the weather was also very cool, with a large amount of rainfall in many sections, especially in Alberta and in Assiniboia. A few light ground frosts occurred locally doing practically no damage. At Regina, on the 18th, a violent thunderstorm was experienced with some hail, and thunderstorms were more or less general during the month in most districts. Harvest conditions were for the most part eminently satisfactory, but were locally delayed by wet.

In Manitoba the weather was a little cooler than usual with a considerable rainfall in the western and north-western portions of the Province, diminishing to a moderate amount in the eastern portion. Thunderstorms were rather numerous, and on the 18th, heavy hail was locally recorded. Conditions generally were very favourable for the crops, and by the close of the month the cereals were practically all cut.

The weather in Ontario was exceedingly dull and wet, and in most districts, especially in the southern portion, it was also quite cool. From 4th to 11th, and 23rd to 31st, rain occurred at many places almost daily, and falls were recorded locally on other dates. During the first half of the month when harvesting was in full operation, there were many fair days but during the second half, grain still out rotted in the fields in some localities. The yield of grain was generally excellent, and reports regarding fruit and roots were most favourable. The maturing of corn was somewhat delayed owing to low temperatures, but the crop was fair in most districts. Between the 6th and 7th, thunderstorms accompanied by hail were experienced in the Niagara Peninsula, and in the Ottawa Valley, and again on the 25th in Western Ontario and in the Niagara Peninsula.

In Quebec the temperature was much below the average throughout the Province with the rainfall below the usual amount over the western portion and considerable above over the eastern portion. Bright sunshine was everywhere deficient, much cloudiness being experienced. The wind mileage was considerably in excess of that of the same month last year, but only one gale was recorded. The general condition of the crops at the close of the month was very promising.

New Brunswick, a cool month with numerous showers and much dull weather, thunderstorms were in some districts accompanied by heavy rainfalls. That of the 22nd was exceptionally severe over the greater part of the Province; at Chatham it is reported to have assumed the proportions of a tornado: considerable damage resulted from lightning as well as from the high winds and heavy local falls of rain and hail. Aurora was generally brilliant on the 21st. At Parrsboro, frost was reported on low grounds on several nights. Crop reports were generally satisfactory except that some kinds of fruit were scarce.

In Nova Scotia the weather was also very cool, but mostly fine, little rain occurring until the 31st, when a very heavy fall was experienced. Yarmouth recording 3.18 inches, and Halifax 2.70 inches. Crops of all kinds promised well.

In Prince Edward Island the weather was reported to have been cold and autumnal like, but at the same time generally fine with a small rainfall. Thunderstorms on the 23rd, when the winds reached the force of a moderate gale locally. All crops promising a good yield.

ATMOSPHERIC PRESSURE.

Over the greater part of the Dominion the atmospheric pressure was above average, the largest departures were +.11 of an inch at Prince Albert, N.W.T., and +.10 at Barkerville, B.C. South-western Ontario was the only portion of Canada where the pressure was below normal, and here it was only slightly so. From Ontario eastward the departures gradually increased till over Cape Breton +.05 was reached. Over Manitoba and the Territories the departures were +.05 or greater.

HIGH AREAS.

Six areas of high pressure were chartered during the month, four first appearing either in Northern British Columbia, or in the far North-West; the other two on the North Pacific Coast. The paths of three of the areas were almost entirely confined to Canadian Territory and three more to the southward. No. 1 which was a continuation of No. 8 of the July series, was probably the most pronounced area of the month, the barometer in its centre reading 30.42 inches reduced to sea level. The areas generally, were if anything, a little more energetic than the usual class of summer highs and they were frequently accompanied by very cool conditions, the night temperatures being often especially low.

LOW AREAS.

Nine areas of depression were sufficiently well defined to be charted. They nearly all travelled from some point west or northwest over, or to the northward of the Lake Region and many were accompanied by copious rainfalls.

No. 1 travelled from Southern California and Arizona to the Lake Superior Region between the 2nd and 5th, thence into the Ottawa Valley and over the Province of Quebec to the Gulf of St. Lawrence. During its presence in the western portion of the Continent numerous heavy rains and thunderstorms were experienced in the Territories and Manitoba, and similar conditions attended its progress from Lake Superior to the Atlantic, some especially heavy thunderstorms accompanied by hail being recorded between the 6th and 7th in the Niagara Peninsula and the Ottawa Valley. No. 2 was a shallow low which appeared over Lake Erie on the night of the 3rd, and disappeared near the Connecticut Coast on the 5th, after giving heavy rains in the Ontario Peninsula, and showers as far as Western Quebec. No. 3 was subsidiary to No. 1. It appeared in the vicinity of Lake Superior on the 7th and dispersed in the Lower St. Lawrence Valley on the 10th attended by a continuance of more or less disturbed conditions from the Lakes to the Maritime Provinces, occasional showers occurring as well as local thunderstorms. No. 4 travelled between the 9th and 13th from the Western States over the Lake Region and the Ottawa and St. Lawrence Valleys, to the Gulf accompanied by widespread showers and thunderstorms. No. 5 was situated in Southern British Columbia on the 14th, and after skirting the Boundary Line it reached the Lake Superior Region during the night of the 17th and the Gulf of St. Lawrence on the 20th. The accompanying rainfall was widely experienced in Quebec and the Maritime Provinces, but locally elsewhere. In Manitoba it caused some heavy thunderstorms attended by hail. No. 6 appeared on the British Columbia Coast on the 18th, reached Manitoba on the 20th, thence passed far north over Canada, and on the 22nd night into the Straits of Belle Isle, causing throughout the Dominion very strong southerly to westerly winds, high temperatures, and numerous showers and thunderstorms, while at Chatham, N.B., on the 22nd, a tornado is reported to have occurred. No. 7 was situated in Lower California on the 22nd, reached Minnesota on the 24th, and on the 25th passed over the Lake Region to the New England States. It was chiefly noticeable for the very heavy rainfalls and local severe thunderstorms which accompanied it over the peninsula of Ontario. No. 8 travelled slowly from the west Pacific States to the Missouri Valley between the 25th and 28th, thence into the Lower Lake Region, dispersing on the 31st, in the Georgian Bay District. It caused a considerable rainfall in Ontario and east to western Quebec, but was chiefly remarkable for the northeasterly gale which it occasioned on Lake Ontario, mainly confined to the western portion. No. 9 was shown in the Canadian Rocky Mountains Range on the 30th, and by the night of the 31st it had travelled to Lake Winnipeg, being attended by a few heavy thunderstorms in the Territories and Manitoba.

WINDS.

In Vancouver Island and over the Mainland of British Columbia the wind direction favoured the south and west, although there were a number of days when it was variable. There were four days with strong, and fourteen with fresh breezes and no gales.

In the North-West Territories the direction was on the whole variable, but favouring somewhat the easterly. There were four days with strong and nineteen with fresh breezes and no general gale.

In Manitoba the easterly direction was most in evidence. There was seven days with strong and thirteen with fresh breezes, and no general gale.

In the Lake Region the south and west directions were the most general, but the easterly was much in evidence at the beginning and at the close of the month. There were nine days with strong, and nine with fresh breezes and the force of a gale from the eastward was recorded in the Lower Lakes on the 5th and also on the 29th and 30th, on Lake Ontario, chiefly confined to the western portion.

In the Ottawa and Upper St. Lawrence Valley the south and west directions slightly predominated, but the easterly was also often experienced. The winds were strong on seven and fresh on twelve days.

In the Lower St. Lawrence and the Gulf the direction was chiefly southerly or westerly. There were nine days of strong and eight of fresh breezes, and one moderate gale occurring on the 22nd.

In the Maritime Provinces the southerly and westerly directions likewise chiefly prevailed. There were three days of strong and nine of fresh breezes and one moderate local gale occurring on the 22nd.

The storm on Lake Ontario between the 28th and 29th was not warned but notification was duly given of the other gales which occurred.

TEMPERATURE.

The temperature was below the average throughout the Dominion from the Pacific to the Atlantic Oceans. The largest negative departures, amounting to from 3 to 6 degrees, were recorded in Ontario and Quebec. In the Maritime Provinces they were from 3 to 4 degrees below, British Columbia and the North-West Territories from 2 to 4 degrees below, and in Manitoba, Lake Superior and the northern portions of Ontario from 1 to 2 degrees below.

The Highest and Lowest temperatures in each Province during August, 1903, were :

British Columbia,	94°·1 on 20th at Tobacco Plains.	30°·0 on 31st at Barkerville.
North-west Territories,	95°·0 on 19th at Medicine Hat.	32°·0 on 18th at Calgary.
Manitoba,	90°·0 on 20th at Aweme, & Treherne.	35°·0 on 22nd at Barnardo.
Ontario,	88°·0 on 22nd at Stony Creek.	29°·0 on 11th at Savanne.
Quebec,	83°·8 on 11th at Sherbrooke.	35°·0 on 24th at St. Agathe des-Monts.
New Brunswick,	81°·0 on 4th at Chatham.	34°·5 on 28th at St. Stephen.
Nova Scotia,	82°·0 on 1st at Port Hastings.	36°·0 on 25th at Truro.
Prince Edward Island,	80°·4 on 4th at Charlottetown.	40°·0 on 3rd at Hamilton.

PRECIPITATION.

The rainfall was below the average over western Quebec, the greater portion of the Maritime Provinces, and from eastern Manitoba to and over the Lake Superior district; elsewhere it was above the average, except locally in northern Saskatchewan, the positive departures being exceptional in many localities. In British Columbia Barkerville recorded 3·5 inches above the average; in the North-West Territories Calgary was 5·4 inches above, Qu'Appelle 3·5 inches above, and Edmonton 2·3 inches above. The peninsula of Ontario was also remarkable for its heavy rainfall, Stony Creek was 4·8 inches above the average, Port Hope 3·3 inches above, Goderich 2·9 inches above, Georgetown, 2·8 inches above, Port Dover, 2·7 inches above. The largest negative departure was reported from St. John, 2·5 inches, and Sydney came next with 2 inches.

BRIGHT SUNSHINE.

The amount of bright sunshine was below the average at all recording stations in the Dominion, except at Fredericton, N.B., where there was a very slight excess. The negative departure from normal were very noticeable in Ontario, Manitoba, and the North-West Territories, and also over the greater portion of British Columbia, amounting to from 13 to 18 per cent.

PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, AUGUST, 1903.

* Stations not furnished with Registering Thermometers.

[illegible]

THESE PAPERS WERE PRESENTED AT STATIONS IN THE DOMINION OF CANADA, AUGUST, 1905.

the parameter not reduced to zero level, solutions not formulated with logging thermometers,

STATION.	Elevation, ft.	Barometer.			Thermometer.			Wind.			Direction of wind from.			Velocity of wind.			Precipitation.			No. of days with rain.	No. of days with snow.	No. of days with fog.	No. of days with hail.	No. of days with sleet.					
		Mean.	Lowest.	Highest.	Mean.	Lowest.	Highest.	Mean.	Lowest.	Highest.	Mean.	Lowest.	Highest.	Mean.	Lowest.	Highest.	Amount.	Difference from average.	Heaviest fall in month.						Days with 1/4 of inch or more.	No. of full days.	No. of rain-falls.	No. of thunder-storms.	No. of days with 1/4 of inch or more.
St. Mary's	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Clinton	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
North Gowanus	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0	32.5	32.0	33.0				
Manhasset Neck	1066	32.5	32.0	33.0	32.5	32.0</																							

October - Cog.	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000
Quebec	66	74	83	92	101	110	119	128	137	146	155	164	173	182	191	200	209	218	227	236	245	254	263	272	281	290	299	308	317	326	335	344	353	362	371	380	389	398	407	416	425	434	443	452	461	470	479	488	497	506	515	524	533	542	551	560	569	578	587	596	605	614	623	632	641	650	659	668	677	686	695	704	713	722	731	740	749	758	767	776	785	794	803	812	821	830	839	848	857	866	875	884	893	902	911	920	929	938	947	956	965	974	983	992	1001	1010	1019	1028	1037	1046	1055	1064	1073	1082	1091	1100	1109	1118	1127	1136	1145	1154	1163	1172	1181	1190	1199	1208	1217	1226	1235	1244	1253	1262	1271	1280	1289	1298	1307	1316	1325	1334	1343	1352	1361	1370	1379	1388	1397	1406	1415	1424	1433	1442	1451	1460	1469	1478	1487	1496	1505	1514	1523	1532	1541	1550	1559	1568	1577	1586	1595	1604	1613	1622	1631	1640	1649	1658	1667	1676	1685	1694	1703	1712	1721	1730	1739	1748	1757	1766	1775	1784	1793	1802	1811	1820	1829	1838	1847	1856	1865	1874	1883	1892	1901	1910	1919	1928	1937	1946	1955	1964	1973	1982	1991	2000																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Chicoutimi	68	76	84	92	100	108	116	124	132	140	148	156	164	172	180	188	196	204	212	220	228	236	244	252	260	268	276	284	292	300	308	316	324	332	340	348	356	364	372	380	388	396	404	412	420	428	436	444	452	460	468	476	484	492	500	508	516	524	532	540	548	556	564	572	580	588	596	604	612	620	628	636	644	652	660	668	676	684	692	700	708	716	724	732	740	748	756	764	772	780	788	796	804	812	820	828	836	844	852	860	868	876	884	892	900	908	916	924	932	940	948	956	964	972	980	988	996	1004	1012	1020	1028	1036	1044	1052	1060	1068	1076	1084	1092	1100	1108	1116	1124	1132	1140	1148	1156	1164	1172	1180	1188	1196	1204	1212	1220	1228	1236	1244	1252	1260	1268	1276	1284	1292	1300	1308	1316	1324	1332	1340	1348	1356	1364	1372	1380	1388	1396	1404	1412	1420	1428	1436	1444	1452	1460	1468	1476	1484	1492	1500	1508	1516	1524	1532	1540	1548	1556	1564	1572	1580	1588	1596	1604	1612	1620	1628	1636	1644	1652	1660	1668	1676	1684	1692	1700	1708	1716	1724	1732	1740	1748	1756	1764	1772	1780	1788	1796	1804	1812	1820	1828	1836	1844	1852	1860	1868	1876	1884	1892	1900	1908	1916	1924	1932	1940	1948	1956	1964	1972	1980	1988	1996	2004																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Father Point	69	77	85	93	101	109	117	125	133	141	149	157	165	173	181	189	197	205	213	221	229	237	245	253	261	269	277	285	293	301	309	317	325	333	341	349	357	365	373	381	389	397	405	413	421	429	437	445	453	461	469	477	485	493	501	509	517	525	533	541	549	557	565	573	581	589	597	605	613	621	629	637	645	653	661	669	677	685	693	701	709	717	725	733	741	749	757	765	773	781	789	797	805	813	821	829	837	845	853	861	869	877	885	893	901	909	917	925	933	941	949	957	965	973	981	989	997	1005	1013	1021	1029	1037	1045	1053	1061	1069	1077	1085	1093	1101	1109	1117	1125	1133	1141	1149	1157	1165	1173	1181	1189	1197	1205	1213	1221	1229	1237	1245	1253	1261	1269	1277	1285	1293	1301	1309	1317	1325	1333	1341	1349	1357	1365	1373	1381	1389	1397	1405	1413	1421	1429	1437	1445	1453	1461	1469	1477	1485	1493	1501	1509	1517	1525	1533	1541	1549	1557	1565	1573	1581	1589	1597	1605	1613	1621	1629	1637	1645	1653	1661	1669	1677	1685	1693	1701	1709	1717	1725	1733	1741	1749	1757	1765	1773	1781	1789	1797	1805	1813	1821	1829	1837	1845	1853	1861	1869	1877	1885	1893	1901	1909	1917	1925	1933	1941	1949	1957	1965	1973	1981	1989	1997	2005																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Cape Charles	70	78	86	94	102	110	118	126	134	142	150	158	166	174	182	190	198	206	214	222	230	238	246	254	262	270	278	286	294	302	310	318	326	334	342	350	358	366	374	382	390	398	406	414	422	430	438	446	454	462	470	478	486	494	502	510	518	526	534	542	550	558	566	574	582	590	598	606	614	622	630	638	646	654	662	670	678	686	694	702	710	718	726	734	742	750	758	766	774	782																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							

PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c., DURING
AUGUST, 1903.

STATIONS.	RAINFALL.					REMARKS.
	Amount in inches.	No. of Days 30 or Over.	No. of Fair Days.	Heaviest Fall in Month.	Date.	
BRITISH COLUMBIA—	in.			in.		
Goldstream Lake.	1.96	14	17	0.60	30	
Copetlam.	1.83	8	23	0.95	13	
Sooke Lake.	1.56	8	23	0.60	21	
Kuper Island.	0.85	6	25	0.28	29	
Nanaimo.	0.61	5	26	0.32	20	
Royal Oak.	0.51	4	27	0.27	13	
Nas Harbour.	4.26	6	25	1.33	6	
Port Essington.	2.97	17	14	0.64	12	8th, 18th, terrific thunderstorms.
N. W. TERRITORIES—						
Dirt Hills.	5.87	16	15	1.39	27	
Beaver Hills W.	2.59	15	16	0.75	2	Aurora, Class 1, Corona 9 p.m.
Foxleigh.	3.26	13	17	0.75	3	
Weyburn.	5.51	5	26	1.27	26	
Salteoats.	3.24	11	19	—		8th, hail storm.
Stirling.	2.95	7	24	2.02	25	
Innisfail.	6.05	12	17	2.18	10	
Bruderheim.	2.13	14	17	0.46	4	
Victoria.	1.83	13	18	0.73	31	
Regina.	3.27	11	19	0.94	4	
Willowbush.	9.66	14	17	2.24	27	
Beaver Hills E.	3.96	12	19	1.62	2	
MANITOBA—						
Gipson.	3.62	14	17	0.63	4	
Norquay.	3.23	15	16	1.03	16	
Cartwright.	6.29	13	18	1.55	3	Aurora 13th, 21st, magnificent, extending S. of Z.
Rapid City.	5.01	11	20	0.70	4	
Belmont.	1.41	16	15	1.31	15	
Rathwell.	2.90	13	15	0.70	16	28th, wheat cutting done.
Lansdowne.	5.01	9	22	1.62	26-27	
Beaver.	2.30	6	24	0.54	17	
Oakdale Park.	5.21	12	19	1.25	1	Thunder, 16th, 17th.
Deloraine.	6.75	11	20	2.25	16	Thunder, 16th.
ONTARIO—						
Orangeville.	3.45	9	22	1.04	4	
Sunshine.	3.60	10	21	1.76	4-5	
Providence Bay.	4.48	16	15	1.60	24	
Lynedoch.	2.88	4	27	1.61	24	
Port Burwell.	5.88	8	23	2.25	23	
Westminster.	3.05	10	21	1.63	23-24	
N. Williamsburg.	2.63	10	21	1.08	29	
Dealtown.	3.79	10	21	1.03	23	
Aurora.	4.08	9	22	1.30	3	
Westport.	5.08	18	13	1.56	6	
Dutton.	2.35	9	22	0.50	28	
Lion's Head.	2.27	6	25	0.66	30	
Princeton.	4.18	8	23	1.83	4	
Midland.	3.17	12	19	0.88	31	
Montague.	3.84	9	22	1.62	6	
Huntsville.	2.49	7	24	1.05	25	Aurora, 21st.
Erst.	2.64	12	19	0.93	30	
Emmshorn.	3.10	5	26	1.25	29	
Warman.	3.61	5	26	1.02	3	
Deer Park.	3.51	8	23	1.06	4	
Watford.	5.31	8	23	2.83	23	
Lansdowne.	4.98	11	20	1.94	4	
Scarboro.	3.18	8	18	1.16	4	
Georgetown.	5.14	10	20	1.61	4	Aurora on 21st and 27th.
Smith's Falls.	3.11	8	23	1.40	6	
Croydon.	4.70	9	22	0.95	25	
Windsor.	2.96	9	22	0.93	25	
Jermyn.	3.35	7	24	1.27	25	
Ensdale.	5.15	15	16	0.75	7	
Arden.	3.25	15	16	0.94	5	
Parma.	3.80	8	23	0.79	31	
Oliver's Ferry.	2.83	9	22	0.60	5	
Godolph.	4.37	8	23	1.54	4	
Lebridge.	3.88	11	17	1.77	25	
Nottawasaga.	3.90	9	22	0.80	4	
Wyoming.	4.11	11	20	1.00	24	
NEW BRUNSWICK—						
Point Escombre.	2.56	12	19	0.71	20	
NOVA SCOTIA—						
Port Morden.	3.44	7	24	1.53	31	

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE
SUN WAS ABOVE THE HORIZON IN THE MONTH OF AUGUST, 1903.

	HOURS ENDING															
	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.
Victoria	0.04	0.45	0.58	0.61	0.68	0.77	0.80	0.73	0.69	0.66	0.59	0.53	0.45	0.07		
Nanaimo	0.20	0.49	0.56	0.59	0.63	0.66	0.62	0.63	0.61	0.52	0.50	0.46	0.43	0.23		
Agassiz	0.00	0.07	0.21	0.34	0.39	0.42	0.45	0.43	0.45	0.42	0.40	0.40	0.27	0.07		
Battleford	0.16	0.32	0.42	0.53	0.59	0.54	0.48	0.47	0.53	0.53	0.48	0.35	0.25	0.06		
Indian Head	0.00	0.14	0.30	0.38	0.55	0.57	0.53	0.46	0.49	0.52	0.49	0.46	0.35	0.07		
Brandon	0.00	0.03	0.37	0.31	0.53	0.60	0.60	0.64	0.58	0.60	0.55	0.45	0.41	0.10		
Winnipeg	0.06	0.34	0.45	0.45	0.55	0.53	0.61	0.62	0.58	0.57	0.58	0.54	0.50	0.13		
Woodstock	0.00	0.27	0.51	0.53	0.52	0.57	0.59	0.60	0.57	0.42	0.42	0.39	0.31	0.01		
Toronto	0.01	0.28	0.47	0.51	0.57	0.56	0.59	0.56	0.55	0.58	0.57	0.43	0.41	0.22		
Lindsay	0.04	0.20	0.30	0.47	0.56	0.55	0.50	0.45	0.47	0.53	0.34	0.27	0.25	0.22		
Barrie																
Gravenhurst	0.00	0.30	0.54	0.60	0.63	0.64	0.60	0.59	0.62	0.58	0.55	0.50	0.50	0.38		
Kingston	0.00	0.04	0.55	0.55	0.59	0.59	0.51	0.58	0.55	0.48	0.48	0.42	0.39	0.10		
Ottawa	0.02	0.33	0.49	0.50	0.59	0.58	0.60	0.62	0.60	0.63	0.55	0.56	0.53	0.07		
Montreal	0.02	0.28	0.50	0.54	0.59	0.61	0.63	0.62	0.57	0.50	0.49	0.24	0.15	0.00		
Quebec	0.04	0.32	0.45	0.53	0.61	0.63	0.65	0.62	0.55	0.52	0.42	0.43	0.42	0.07		
Fredericton	0.01	0.35	0.56	0.68	0.68	0.71	0.74	0.72	0.73	0.65	0.57	0.58	0.52	0.06		

	Victoria.	Nanaimo.	Agassiz.	Battleford.	Indian Head.	Brandon.	Winnipeg.	Woodstock.	Toronto.	Lindsay.	Barrie.	Gravenhurst.	Kingston.	Ottawa.	Montreal.	Quebec.	Fredericton.
Mean proportion for month. (Constant sunshine being 1.)	0.53	0.50	0.30	0.40	0.33	0.42	0.46	0.41	0.45	0.38		0.50	0.41	0.47	0.47	0.44	0.54
Difference from average.	0.04	—	0.16	0.18	0.12	0.16	0.13	0.14	0.13	0.16		—	0.15	0.05	0.10	—	0.05
Maximum daily amount.	0.86	0.93	0.82	0.88	0.82	0.82	0.90	0.82	0.90	0.90		0.90	0.82	0.87	0.86	0.83	0.88
Date.	26	11	18	17	21	21	19	20	20	14		22	24	27	1	3	28
No. of days completely clouded	0	3	11	2	4	5	3	7	5	4		2	5	6	4	0	3

Aurora recorded :—

Where the class of aurora is noted by the observer, it is given, (I) being the brightest, (IV) the feeblest in brilliancy.

1. Bala.
3. Channel Island, IV.
11. Savanne.
12. Haileybury, IV.
13. Aweme, III : Cartwright, Haileybury, IV.
14. Aweme, I : Moose Jaw, Swift Current, III : Haileybury, Bowsman, IV.
16. Channel Island.
17. Threehills Creek, III.
19. Rat Portage, IV : Threehills Creek, III.
20. Rat Portage, I : Aweme, III : Melfort, III : Sydney, II : Haileybury, III : Bowsman, IV.
21. Fredericton, Gravenhurst, IV : Deseronto, II : Welland, Clinton, II : Peterboro', *fine* : Bruce Mines, I : Meaford, Erasmus, Birnam, III : Port Dover, Cape Chatte, III : Estevan, II : Grenfell, *very fine* : Moose Jaw, Melfort, I, *very active* : Huntsville, II : Port Arthur, I : Grand Manan, IV : Edmonton, IV : Swift Current, III : Port Stanley, III : Georgetown, II : Beaver Hills W., I : Cartwright, *magnificent display extending S. of zenith* : Quebec, III : Yarmouth, III : St. John, III : Haileybury, I : Truro, III : Pictou, II : Huntsville, II : Bowsman, II.
22. Cockburn Island.
23. Quebec, IV : Haileybury, IV.
26. Chicoutimi, Quebec, IV : Bowsman, IV.
27. Georgetown, III.
28. Truro, IV.
29. Savanne.

Thunder recorded on :—

1. Macleod, Nicola Lake, W. Kootenay, Pincher Creek, Coutts.
2. W. Kootenay, Gray Hill, Threehills Creek, Gleichen, St. Johns, Pilot Bay.
3. Macleod, Sarnia, Lucknow, Point Clark, Birnam, Hillview, Aweme, Estevan, Gleichen, Belmont, Minnedosa, Calgary, Barnardo, Kitamaat.
4. Clinton, Hillview, Almasippi, Aweme, Gatesgarth, Moose Jaw, Belmont, Regina, Willow Bunch, Wyoming, Norquay, Qu'Appelle, Medicine Hat.
5. Agincourt, Hillview, Estevan, Belmont, Port Arthur, Winnipeg, White River, Rivers Inlet, Oakdale Park, Kitamaat.
6. Westport, Montague, Ursa, Scarboro, Smith Falls, Croydon, Montreal, Lindsay, North Gower, Rocklyn, Clontarf, Bruce Mines, Cockburn Island, Birnam, Toronto, Chicoutimi, W. Kootenay, Princeton, Providence Bay, N. Williamsburg, Haileybury, Uplands.
7. St. Agathe des Monts, Sutton, Lakefield, W. Kootenay, Threehills Creek, Swift Current.
8. Point Clarke, Golden, Gatesgarth, New Hope, Indian Head, Moose Jaw, Bon Accord, Crescent Lake, Providence, Wiarton, Biederheim, Regina, Swift Current, White River, Saugeen, Barnardo, Port Essington.
9. Macleod, Agincourt, Toronto, W. Kootenay, Gray Hill, Gleichen, Sunshine, Coutts, Scarboro', Banff, Calgary, Pilot Bay.
10. Bruce Mines, Meaford, Cockburn Island, Toronto, Nicola Lake, Threehills Creek, Providence Bay, Lion's Head, Scarboro, Smith's Falls.
11. Gravenhurst, Deseronto, Welland, Sutton, Belleville, Bala, Brome, Chicoutimi, Sherbrooke, Threehills Creek, Gleichen, Lion's Head, Croydon, Emsdale, Arden, Montreal, Medicine Hat, Quebec, Parry Sound, Pilot Bay.
12. Vankleek Hill, Point Clark, Chicoutimi, Quesnel, Golden, New Hope, Father Point.
13. Macleod, Summerside, Bullion, Estevan, Gatesgarth.
14. Rat Portage, Oakbank, Gleichen, Ursa, Rathwell, Winnipeg, Pictou.
15. Macleod, Nicola Lake, Princeton, Brandon, Hillview, Gleichen, Arden, Charlottetown, Winnipeg, Medicine Hat, Pictou, Deloraine.

16. St. Agathe, Chicoutimi, Moncton, Brandon, Aweme, Gray Hill, Estevan, Quebec, Gatesgarth, Indian Head, Moose Jaw, Belmont, Norquay, Winnipeg, Medicine Hat, Truro, Pictou, Doloraine, Shawinigan Falls.
17. Stony Mountain, Rat Portage, Cockburn Island, Brome, Parrsboro, Moncton, Brandon, Hillview, Oakbank, Grenfell, Westport, Rathwell, Norquay, Qu'Appelle, Winnipeg, Minnedosa, Quebec, St. John, Barnardo, Truro, Channel Island, Bowsman.
18. Stony Mountain, Bruce Mines, Cockburn Island, Quesnel, Princeton, Westport, Emsdale, Winnipeg, White River, Haileybury, Uplands, Rivers Inlet, Bowsman, Stuart Lake.
19. Chilliwack, Lindsay, Lucknow, Agincourt, Erasmus, Birnam, Bullion, Savanne, Brome, Sherbrooke, N. Nicomen, Quesnel, Golden, Nicola Lake, Gray Hill, Bon Accord, Wetaskiwin, Sunshine, Westminster, Aurora, Westport, Lion's Head, Smith's Falls, Wyoming, Barkerville, Bermuda, White River, Quebec, Stuart Lake, London.
20. St. Agathe, Belleville, Hillview, Aweme, Gray Hill, Onion Lake, Crescent Lake, Belmont, Rathwell, Foxleigh, Winnipeg, Bowsman.
21. Macleod, Bala, Bruce Mine, Cockburn Island, Birnam, Gleichen, Providence Bay, Emsdale, White River, Haileybury, Parry Sound, Uplands.
22. Fredericton, Point Escuminac, Agincourt, Macleod, Brome, Sherbrooke, Parrsboro, Sussex, Moncton, Nicola Lake, Princeton, Estevan, Threehills Creek, New Hope, Crescent Lake, Bermuda, Father Point, Grand Manan, Montreal, Medicine Hat, White River, Quebec, St. John, Truro.
23. Summerside, Hamilton, P.E.I., Nicola Lake, Hillview, Estevan, New Hope, Crescent Lake, Belmont, Rathwell, Regina, Willow Bunch, Wyoming, Swift Current, Charlottetown, Barnardo, Pictou.
24. Woodstock, Welland, Clinton, Stratford, Lucknow, Point Clark, Erasmus, Port Dover, Paris, Owen Sound, Nicola Lake, Hillview, Aurora, Ursa, Wiarton, Scarboro, Wyoming, Port Stanley.
25. Gravenhurst, Deseronto, Lindsay, Beatrice, Welland, Clinton, Sutton, Belleville, Paris, Peterboro', Bala, Stony Creek, Agincourt, Erasmus, Birnam, Port Dover, Brantford, Toronto, Estevan, Sunshine, Providence Bay, Westminster, Westport, Dutton, Princeton, Ursa, Georgetown, Emsdale, Port Stanley, Saugeen.
26. New Hope, Arden.
27. New Hope, Bermuda, Truro.
28. Golden, Nicola Lake, Princeton.
29. Quesnel, W. Kootenay, Onion Lake, Dealtown, Wiarton, Bruederheim, Wyoming, Port Stanley, Pilot Bay.
30. Welland, Meaford, Owen Sound, New Hope, Bon Accord, Sunshine, Nottawasaga.
31. Lindsay, Beatrice, Bala, Agincourt, Erasmus, Toronto, Brandon, Hillview, Oakbank, Almasippi, Westminster, Belmont, Midland, Rathwell, Georgetown, Emsdale, Nottawasaga, Edmonton, Yarmouth, Truro, Pictou, Upland.

FORECASTS FOR AUGUST, 1903.

The forecasts issued by this office at 11 p.m. each night, are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of predictions issued during the month was 1165. These were divided as follows :—

DISTRICT.	No. Issued.	VERIFIED.			
		No. Fully	No. Partly	No. Not	Percentage
Manitoba.....	83	69	9	5	88.5
Lake Superior.....	118	97	15	6	88.5
Lower Lake Region.....	141	121	18	2	92.2
Georgian Bay.....	139	119	16	4	91.4
Ottawa Valley.....	115	93	12	10	86.1
Upper St. Lawrence.....	113	93	13	7	88.0
Lower St. Lawrence ..	118	102	8	8	89.8
Gulf.....	112	94	12	6	89.3
Maritime Provinces, West.....	114	101	12	1	93.8
Maritime Provinces, East..	112	96	15	1	94.2
Total.....	1,165	985	130	50	90.1

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

Meteorological Office, Toronto,
26th September, 1903.

R. F. STUPART,
Director.

DEPARTMENT OF MARINE AND FISHERIES, CANADA.

METEOROLOGICAL SERVICE.

Monthly Weather Review.

VOL. XXVII.

SEPTEMBER, 1903



INTRODUCTION

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the material used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

REMARKS UPON THE WEATHER.

The weather in British Columbia was exceedingly wet, and in most districts it was quite cool. Rain occurred mostly during the second and fourth weeks and much bright sunshine was recorded during the intervening periods. Over the upper mainland frosts were noted at many places, and in Cariboo there were several light falls of snow. Vegetation shewed early signs of autumn decay.

In the North-west Territories the weather was somewhat dull, more especially during the first ten or twelve days, when the precipitation which was in most districts comparatively light in the aggregate was mostly recorded. This unsettled weather culminated in a storm on the 12th, which was mostly felt in eastern Assiniboia when some snow to the depth of several inches was recorded in many districts. Light snow was also recorded at a few places on the same day in western Assiniboia and southern Alberta during another atmospheric disturbance. On or about the 15th the temperature, which had been quite low for several days, rose considerably; and although it was generally quite low again on or about the 21st the weather was mostly fair and moderately warm during the second half of the month. Vegetation was backward and the ripening of seeds was somewhat late.

The weather in Manitoba followed much the same sequence as in the Territories, it being comparatively unsettled with occasional rain during the first twelve or thirteen days, after which, although the sky was frequently overcast, the weather was mostly fair. The storm of the 12th was particularly severe in this province. Snow varying from a trace to seven or eight inches fell in many districts west of Winnipeg but it soon melted and in the eastern portion of the province the precipitation was almost altogether rain or sleet.

In Ontario there was much fine weather, more especially during the first week and after the 19th. These conditions were more marked in southern localities than in northern and western districts, the rainfall being also light in the former and quite heavy in the latter portions of the province. Light frosts occurred at some places on or about the 28th, but little damage was caused thereby and vegetation was normal on the 30th.

In the province of Quebec although showers were somewhat frequent throughout the month they were mostly light, the rainfall in the aggregate being quite small and the amount of sunshine greater than usual. A southwest gale occurred on the 27th and light frosts were recorded at a few places late in month. Vegetation was somewhat affected by drought, and although the weather was milder than usual it presented a rather withered appearance on the 30th.

The weather in New Brunswick was mostly fair, bright and dry, the rain recorded only being general on or about the 1st, 5th, 18th, 25th and 28th. On the 4th and 14th the temperature exceeded 80° at some places and although the nights were frequently quite cool it was unusually warm on many days. A moderate gale was recorded on the 17th, and thunderstorms were general on or about the 5th and 28th. Light frosts were noted on the 8th and 30th. Vegetation was normal.

In Nova Scotia there was much rain in most districts, more especially from the 1st to 8th and 16th to 28th, but sunshine followed the showers in quick succession, and there was much fine, bright weather with comparatively high temperatures. Light frosts were recorded at a few places on the 30th, but they caused little damage and vegetation was normal on that date.

The weather in Prince Edward Island did not depart much from the normal, but showers were somewhat frequent during the first nine or ten days, and they were also reported on the 18th, 25th and 28th, the snowfall in the aggregate exceeding the average amount. Frosts were not recorded in this province and vegetation was in normal condition on the 30th.— F. F. PAYNE.

ATMOSPHERIC PRESSURE.

With local exceptions in British Columbia and Alberta the mean atmospheric pressure for September exceeded the normal throughout Canada. The range of departure was 0.10 of an inch, the extremes being -0.02 of an inch at Kamloops, B.C., and $+0.08$ of an inch at Battleford, N.W.T.

HIGH AREAS.

A feature of the high areas of September was the similarity of the paths travelled. Eight areas were charted and of this number five were traced across the continent from the North-West States and Territories to the Atlantic coast, passing out to sea between the 35th and 45th parallels of latitude. The importance of these areas was also very similar, and only one, No. 7, reached any remarkable proportions. On the 23rd while this area was over Manitoba a barometer reading of 30.56 inches was recorded at Minnedosa.

LOW AREAS.

The low areas, like the high areas, in general followed a very similar course. Eleven areas were charted, four of which were traced eastward across the Continent to the Gulf of St. Lawrence, and three confined to the North-West States and Territories. No. 3 was the most important area as far as western Canada was concerned. Originating in the far South-West States during the 10th it moved northward over Nebraska, Dakota and Minnesota, and on the 12th swept over Manitoba, and thence north-east and east to the Gulf of St. Lawrence on the 14th. A heavy gale prevailed throughout Manitoba and was accompanied by rain to the eastward of Manitoba and soft snow west to Broadview, Assa. It also caused fresh to heavy gales in the Gulf as it continued on its easterly course. No. 5 was a tropical storm. It was first observed off the Southern Florida Coast on the 12th, and followed an erratic course to the Lower Lakes where on the 17th it was reinforced by a subsidiary, and the combined system then passed rapidly down the St. Lawrence. Moderate gales were prevalent on the Lakes during the presence of this area, and heavy gales occurred in the Gulf on the 18th as it passed eastward. No. 8 moved from British Columbia to the Gulf of St. Lawrence between the 21st and 23rd, and was accompanied by strong winds and gales from the Lakes to the Atlantic. No. 9 appeared off the Florida coast on the 22nd, and passing northward apparently merged with No. 8 while off the Nova Scotia Coast. No. 10 passed across the continent from British Columbia to Newfoundland between the 22nd and 29th. It was accompanied by strong winds and moderate gales and by warm weather throughout its course.

WINDS.

In British Columbia on Vancouver Island and over the Mainland the direction favoured the south and west, but there were a good many occasions when it was variable. There were six days with strong and eight with fresh breezes, and on two occasions the force of a gale was recorded.

In the North-west Territories the south and west directions predominated. There were thirteen days with strong and nine with fresh breezes and one general gale.

In Manitoba the direction was mainly between the south and west. Three gales were experienced and ten days of strong and nine of fresh breezes.

In the Lake Region the direction was mostly southerly to westerly. Gales were recorded generally on three occasions, and there were five days with strong and ten with fresh breezes.

In the Ottawa and Upper St. Lawrence valleys the direction was very largely southerly to westerly with four days of strong and twelve of fresh breezes, and three gales.

In the Lower St. Lawrence valley and the Gulf the direction was chiefly southerly to westerly with three gales and six days of strong and fifteen of fresh breezes.

In the Maritime Provinces the direction was also very largely southerly to westerly, with one gale and eight days of strong and thirteen of fresh breezes.

The gales which occurred over the different districts were all successfully warned, the heaviest storm being that which was experienced in the Lake Region between the 26th and 27th.

TEMPERATURE.

The mean temperature of the month was lower than average over the Mainland of British Columbia, throughout the North-west Territories, in Manitoba and in Ontario north of the Great Lakes, the largest negative departure, about 6° , being in British Columbia and Saskatchewan. In the Territories, in only three

of the past twenty years has the September mean been as low as during the month just closed. From Lake Huron eastward over Ontario, Quebec and the Maritime Provinces the mean was very nearly average, but a positive departure of about 1° was fairly general.

The Highest and Lowest temperatures in each Province during September, 1907, were:

British Columbia,	82.2 on 3rd at Alberni.	21.0 on 11th at Bullion.
North-west Territories,	89.0 on 1st at Estevan.	17.8 on 30th at Kneehill.
Manitoba,	81.0 on 1st at Portage La Prairie.	21.0 on 23rd at Bernardo.
Ontario,	93.0 on 15th at Cottam.	19.0 on 29th at White River.
Quebec,	86.0 on 13th at Sherbrooke.	26.0 on 30th at Brome.
New Brunswick,	83.8 on 11th at St. Stephen.	28.0 on 30th at Brome.
Nova Scotia,	89.6 on 3rd at Pictou.	31.0 on 31st at Parrsboro.
Prince Edward Island,	76.0 on 4th at Charlottetown.	38.3 on 30th at Hamilton.

PRECIPITATION.

The precipitation was considerably in excess of the average in British Columbia, and in excess to a lesser extent in Manitoba, Northern Ontario, Prince Edward Island and Nova Scotia. In Southern Ontario and in Quebec there was a marked deficiency, while in the North-west Territories the departures from average were not pronounced, and in some localities were positive and in others negative.

BRIGHT SUNSHINE.

The mean proportion of Bright Sunshine for September was subnormal from British Columbia to Manitoba, and also locally in Ontario; elsewhere in Canada an excess of the average amount was recorded. The extremes of departure were + 17% at Battleford, N.W.T. and - 10% at Montreal, Que.

TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, SEPTEMBER, 1905

Barometer not reduced to Sea level. * Stations not furnished with Registering Thermometers.

[illegible]

[illegible]

Colony	1860	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100	2110	2120	2130	2140	2150	2160	2170	2180	2190	2200	2210	2220	2230	2240	2250	2260	2270	2280	2290	2300	2310	2320	2330	2340	2350	2360	2370	2380	2390	2400	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500	2510	2520	2530	2540	2550	2560	2570	2580	2590	2600	2610	2620	2630	2640	2650	2660	2670	2680	2690	2700	2710	2720	2730	2740	2750	2760	2770	2780	2790	2800	2810	2820	2830	2840	2850	2860	2870	2880	2890	2900	2910	2920	2930	2940	2950	2960	2970	2980	2990	3000	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140	3150	3160	3170	3180	3190	3200	3210	3220	3230	3240	3250	3260	3270	3280	3290	3300	3310	3320	3330	3340	3350	3360	3370	3380	3390	3400	3410	3420	3430	3440	3450	3460	3470	3480	3490	3500	3510	3520	3530	3540	3550	3560	3570	3580	3590	3600	3610	3620	3630	3640	3650	3660	3670	3680	3690	3700	3710	3720	3730	3740	3750	3760	3770	3780	3790	3800	3810	3820	3830	3840	3850	3860	3870	3880	3890	3900	3910	3920	3930	3940	3950	3960	3970	3980	3990	4000	4010	4020	4030	4040	4050	4060	4070	4080	4090	4100	4110	4120	4130	4140	4150	4160	4170	4180	4190	4200	4210	4220	4230	4240	4250	4260	4270	4280	4290	4300	4310	4320	4330	4340	4350	4360	4370	4380	4390	4400	4410	4420	4430	4440	4450	4460	4470	4480	4490	4500	4510	4520	4530	4540	4550	4560	4570	4580	4590	4600	4610	4620	4630	4640	4650	4660	4670	4680	4690	4700	4710	4720	4730	4740	4750	4760	4770	4780	4790	4800	4810	4820	4830	4840	4850	4860	4870	4880	4890	4900	4910	4920	4930	4940	4950	4960	4970	4980	4990	5000	5010	5020	5030	5040	5050	5060	5070	5080	5090	5100	5110	5120	5130	5140	5150	5160	5170	5180	5190	5200	5210	5220	5230	5240	5250	5260	5270	5280	5290	5300	5310	5320	5330	5340	5350	5360	5370	5380	5390	5400	5410	5420	5430	5440	5450	5460	5470	5480	5490	5500	5510	5520	5530	5540	5550	5560	5570	5580	5590	5600	5610	5620	5630	5640	5650	5660	5670	5680	5690	5700	5710	5720	5730	5740	5750	5760	5770	5780	5790	5800	5810	5820	5830	5840	5850	5860	5870	5880	5890	5900	5910	5920	5930	5940	5950	5960	5970	5980	5990	6000	6010	6020	6030	6040	6050	6060	6070	6080	6090	6100	6110	6120	6130	6140	6150	6160	6170	6180	6190	6200	6210	6220	6230	6240	6250	6260	6270	6280	6290	6300	6310	6320	6330	6340	6350	6360	6370	6380	6390	6400	6410	6420	6430	6440	6450	6460	6470	6480	6490	6500	6510	6520	6530	6540	6550	6560	6570	6580	6590	6600	6610	6620	6630	6640	6650	6660	6670	6680	6690	6700	6710	6720	6730	6740	6750	6760	6770	6780	6790	6800	6810	6820	6830	6840	6850	6860	6870	6880	6890	6900	6910	6920	6930	6940	6950	6960	6970	6980	6990	7000	7010	7020	7030	7040	7050	7060	7070	7080	7090	7100	7110	7120	7130	7140	7150	7160	7170	7180	7190	7200	7210	7220	7230	7240	7250	7260	7270	7280	7290	7300	7310	7320	7330	7340	7350	7360	7370	7380	7390	7400	7410	7420	7430	7440	7450	7460	7470	7480	7490	7500	7510	7520	7530	7540	7550	7560	7570	7580	7590	7600	7610	7620	7630	7640	7650	7660	7670	7680	7690	7700	7710	7720	7730	7740	7750	7760	7770	7780	7790	7800	7810	7820	7830	7840	7850	7860	7870	7880	7890	7900	7910	7920	7930	7940	7950	7960	7970	7980	7990	8000	8010	8020	8030	8040	8050	8060	8070	8080	8090	8100	8110	8120	8130	8140	8150	8160	8170	8180	8190	8200	8210	8220	8230	8240	8250	8260	8270	8280	8290	8300	8310	8320	8330	8340	8350	8360	8370	8380	8390	8400	8410	8420	8430	8440	8450	8460	8470	8480	8490	8500	8510	8520	8530	8540	8550	8560	8570	8580	8590	8600	8610	8620	8630	8640	8650	8660	8670	8680	8690	8700	8710	8720	8730	8740	8750	8760	8770	8780	8790	8800	8810	8820	8830	8840	8850	8860	8870	8880	8890	8900	8910	8920	8930	8940	8950	8960	8970	8980	8990	9000	9010	9020	9030	9040	9050	9060	9070	9080	9090	9100	9110	9120	9130	9140	9150	9160	9170	9180	9190	9200	9210	9220	9230	9240	9250	9260	9270	9280	9290	9300	9310	9320	9330	9340	9350	9360	9370	9380	9390	9400	9410	9420	9430	9440	9450	9460	9470	9480	9490	9500	9510	9520	9530	9540	9550	9560	9570	9580	9590	9600	9610	9620	9630	9640	9650	9660	9670	9680	9690	9700	9710	9720	9730	9740	9750	9760	9770	9780	9790	9800	9810	9820	9830	9840	9850	9860	9870	9880	9890	9900	9910	9920	9930	9940	9950	9960	9970	9980	9990	10000
Quebec	46	48	51	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	68																																																																																																																																																																																				

PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c., DURING
SEPTEMBER, 1903.

STATIONS.	RAINFALL.					SNOWFALL.				REMARKS.
	Amount	No. of	No. of	Heaviest	Date.	Amount	No. of	Heaviest	Date.	
	in inches.	Days '91 or Over.	Fair Days.	Fall in Month		in inches.	Days.	Fall in Month		
<hr/>										
BRITISH COLUMBIA—	in.			in.		in.		in.		
Port Essington	17.20	11	20	8.33	29	.....	.....	.....	.....
Sooke Lake	5.75	12	19	2.85	23	.....	.....	.....	.....
Goldstream Lake	5.83	15	15	2.73	23	.....	.....	.....	.....
Cogutlam	9.85	10	20	2.67	23	.....	.....	.....	.....
Nanaimo	3.34	7	23	2.17	23	.....	.....	.....	.....
Royal Oak	3.83	9	21	1.75	22	.....	.....	.....	.....
Kuper Island	3.44	17	13	1.30	23	.....	.....	.....	.....	Thunder, 7th.
Nass Harbour	7.59	17	13	1.00	6	.....	.....	.....	.....
N. W. TERRITORIES—										
Lacombe	0.97	5	25	0.43	22	.....	.....	.....	.....
Foxleigh	1.00	10	20	0.40	6	*	3	.....	.....	Lightning on 19th.
Gaults	0.73	5	25	0.31	8	*	1	.....	.....
Saults	1.84	6	24	0.58	12	4.0	2	4.0	12	
Dirt Hills	1.16	9	19	0.51	6	3.5	3	2.5	12	
Bruderheim	1.03	5	25	0.43	6	.....	.....	.....	.....
Willow Bunch	0.50	7	25	0.15	11	*	1	.....	.....	Thunder on 21st.
Innisfil	2.38	10	18	1.10	21	*	1	.....	.....
Stirling	1.10	4	26	0.53	7	.....	.....	.....	.....
Beaver Hills W.	1.45	15	15	0.28	6	*	2	.....	.....	Thunder, 1st.
Regina	0.77	6	23	0.52	6	0.3	1	.....	.....
Beaver Hills, E.	1.88	5	25	0.60	6	.....	.....	.....	.....
MANITOBA										
Deloraine	2.14	6	24	1.02	6	9.0	1	9.0	12	14th, ice $\frac{3}{4}$ inch thick.
Belmont	2.78	6	24	0.94	7	*	1	.....	.....	Thunder, 1st.
Rathwell	3.62	6	21	2.61	9	*	1	.....	.....	Snow on 12th included.
Cartwright	4.35	3	27	2.71	26	*	1	.....	.....	do do do
Beaver	3.65	8	22	2.16	12	.....	.....	.....	.....
Notquay	3.21	6	22	1.36	12	1.5	1	1.5	12	Thunder, 1st.
Gresham	3.20	4	23	1.62	12	*	1	.....	.....	Included in rain.
Rapid City	2.40	4	25	1.35	12	10.0	1	10.0	12	
ONTARIO—										
Lion's Head	3.55	12	18	1.24	17	.....	.....	.....	.....
Westminster	2.01	6	22	1.21	16	.....	.....	.....	.....	Thunder on 15th.
Dealtown	2.65	6	24	0.98	15	.....	.....	.....	.....	Frost, 28th.
Sunshine	4.31	12	18	1.27	17	.....	.....	.....	.....	Thunder, 9th, 15th & 17th.
Timonston	1.06	5	25	0.73	17	.....	.....	.....	.....	Ther. 90.
Dutton	1.53	5	25	0.63	7	.....	.....	.....	.....
Ursa	4.57	14	16	1.15	10	.....	.....	.....	.....	Thunder, 3, 8, 9, 14, 15, 16, 23, 30th.
Nottawasaga Island	3.30	8	22	1.00	17	.....	.....	.....	.....	Aurora, 18th, 20th, thun- der, 30th.
Sydenham	1.03	2	28	0.98	17	.....	.....	.....	.....
Orangeville	3.16	11	19	0.70	17	.....	.....	.....	.....
Jennyn	0.77	3	27	0.34	17	.....	.....	.....	.....
Midland	4.40	11	19	1.15	16	.....	.....	.....	.....	Thunder, 9, 10, 13, 14, 15, 23rd. Aurora, 22nd.
Arden	1.80	5	25	1.24	18	.....	.....	.....	.....	Thunder, 5th, 16th.
Croydon	0.69	1	27	0.60	17	.....	.....	.....	.....	Thunder, 17th.
Godrich	3.72	14	19	1.20	17	.....	.....	.....	.....
Georgetown	1.79	6	21	0.79	16	.....	.....	.....	.....	Thunder, 9th, 10th, 16th. Aurora, 19th, 22nd, 28th.
Parham	1.12	3	27	0.80	18	.....	.....	.....	.....
Wooden	0.42	4	26	0.26	17	.....	.....	.....	.....	20th, ice.
Snider's Falls	2.24	7	23	1.02	17	.....	.....	.....	.....
Montague	1.45	5	25	0.67	17	.....	.....	.....	.....	13th, 84 in shade.
Scarboro	0.31	5	23	0.15	17	.....	.....	.....	.....
Aurora	0.84	6	24	0.30	24	.....	.....	.....	.....	Thunder, 1th, 16th
Udralgo	0.61	5	25	0.33	17	.....	.....	.....	.....
Lynedoch	1.65	5	25	0.65	12	.....	.....	.....	.....
Port Barwell	0.93	5	25	0.34	17	.....	.....	.....	.....
Westport	0.27	1	26	0.11	17	.....	.....	.....	.....	Thunder, 16th, 18th.
Don Park	0.45	3	27	0.27	18	.....	.....	.....	.....
N. W. Langsburg	1.57	4	26	1.08	17	.....	.....	.....	.....
Presqu'île Bay	5.00	19	11	0.88	17	.....	.....	.....	.....	Thunder, 2, 3, 10, 16th.
Windsor	5.02	12	18	1.39	9	.....	.....	.....	.....	Thunder, 9, 12, 15th.
Emmerson	1.48	4	22	0.95	9	.....	.....	.....	.....
Windsor	2.49	6	24	0.75	30	.....	.....	.....	.....
Lansdowne	1.66	2	28	1.61	17	.....	.....	.....	.....	Thunder, 1th.
Oliver, Ferry	1.42	4	26	0.60	17	.....	.....	.....	.....
Wyoming	2.90	6	24	1.00	16	.....	.....	.....	.....	Thunder, 13th, 16th.
Exile	0.17	14	16	1.30	10	.....	.....	.....	.....	Thunder, 2, 3, 9, 10, 12, 14, 15, 16, 23.
Hagers	1.94	12	18	0.74	1	.....	.....	.....	.....	Thunder, 4, 10. Aurora, 19th.
NEW BRUNSWICK										
Point Esprit	1.37	6	24	0.38	24	.....	.....	.....	.....	Aurora, 9th.
NEW SCOTIA										
Port Morden	2.91	8	22	1.37	22	.....	.....	.....	.....

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE
SUN WAS ABOVE THE HORIZON IN THE MONTH OF SEPTEMBER, 1901

	Hours Ending													
	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.
Victoria		0.00	0.16	0.37	0.50	0.53	0.58	0.62	0.60	0.57	0.56	0.45	0.46	0.13
Nanaimo		0.14	0.23	0.44	0.43	0.52	0.60	0.62	0.62	0.55	0.57	0.50	0.45	0.14
Agassiz		0.00	0.02	0.12	0.29	0.27	0.34	0.41	0.48	0.51	0.44	0.40	0.49	0.07
Battleford		0.04	0.09	0.26	0.39	0.41	0.46	0.43	0.44	0.41	0.41	0.27	0.43	0.02
Indian Head		0.00	0.00	0.07	0.27	0.41	0.49	0.51	0.52	0.55	0.49	0.42	0.27	0.04
Brandon		0.00	0.00	0.13	0.38	0.46	0.55	0.55	0.53	0.55	0.52	0.48	0.36	0.16
Winnipeg		0.00	0.02	0.34	0.55	0.55	0.57	0.53	0.51	0.53	0.46	0.41	0.26	0.05
Woodstock		0.00	0.01	0.39	0.73	0.81	0.75	0.66	0.67	0.70	0.69	0.53	0.27	0.02
Toronto		0.00	0.03	0.51	0.71	0.75	0.71	0.76	0.82	0.79	0.76	0.72	0.59	0.02
Lindsay		0.03	0.20	0.42	0.55	0.62	0.63	0.69	0.65	0.65	0.62	0.40	0.32	0.05
Barrie														
Gravenhurst		0.00	0.09	0.27	0.38	0.47	0.49	0.57	0.60	0.51	0.44	0.39	0.36	0.15
Kingston		0.00	0.57	0.81	0.78	0.78	0.79	0.73	0.77	0.73	0.65	0.52	0.05	0.00
Ottawa		0.00	0.01	0.34	0.55	0.63	0.62	0.63	0.65	0.62	0.63	0.61	0.41	0.04
Montreal		0.00	0.05	0.55	0.73	0.84	0.83	0.84	0.72	0.75	0.71	0.65	0.38	0.00
Quebec		0.00	0.06	0.38	0.45	0.56	0.67	0.67	0.73	0.70	0.72	0.73	0.61	0.11
Fredericton		0.00	0.09	0.46	0.57	0.58	0.65	0.75	0.67	0.64	0.69	0.72	0.64	0.30

	Victoria	Nanaimo	Agassiz	Battleford	Indian Head	Brandon	Winnipeg	Woodstock	Toronto	Lindsay	Barrie	Gravenhurst	Kingston	Ottawa	Montreal	Quebec	Fredericton
Mean proportion for month (Constant sunshine being 1.)	0.43	0.45	0.28	0.30	0.32	0.37	0.38	0.50	0.59	0.49		0.43	0.57	0.46	0.64	0.51	0.54
Difference from average	0.03		0.03	0.17	0.07	0.10	0.09	0.01	0.03	0.03		-	0.06	0.03	0.10		0.04
Maximum daily amount	0.85	0.92	0.85	0.70	0.75	0.75	0.80	0.80	0.91	0.94		0.92	0.80	0.80	0.90	0.85	0.88
Date	23	2	2	29	5	5	5	29	29	26		5	22	8 19 22	22	22	9
No. of days completely clouded	5	5	11	4	7	4	4	2	1	1		1	1	2	0	1	3

Aurora recorded :—

Where the class of aurora is noted by the observer, it is given, (I) being the brightest, (IV) the feeblest in brilliancy.

2. Davis Inlet.
8. Cape Chatte, II.
9. Point Escuminac, III; Davis Inlet.
12. Truro, IV.
14. Bowsman, IV.
15. Davis Inlet.
17. Haileybury, IV.
18. Nottawasaga, Aweme, II; Oakbank, Chicoutimi, Davis Inlet, Haileybury, IV.
19. Deseronto, I; Gravenhurst, II; Truro, IV; Barnardo, Cartwright, Georgetown, III; Bala, Emsdale, II; Huntsville, IV; Birnam, IV; Rat Portage, Clinton, II; Estevan, II; Aweme, I; Sherbrooke, Cape Magdelene, Cape Chatte, I; Qu'Appelle, IV; Minnedosa, III; Port Stanley, III; Quebec, IV; Bowsman, IV.
20. Nottawasaga, Sutton, Onion Lake, III; Threehills Creek, Wetaskiwin, Edmonton, IV; Minnedosa, I; Haileybury, II; Grand Manan, IV.
22. Truro, IV; Pictou, Barnardo, Midland, Georgetown, IV; Port Hope, Onion Lake, I; Melfort, I; Aweme, I; Cape Chatte, III; Grand Manan, IV; Quebec, III; Bowsman, IV; Haileybury IV.
23. Truro, IV; Pictou, Sutton, Onion Lake, IV; Swift Current, IV; Minnedosa, II; Grand Manan, IV; Yarmouth, IV; Haileybury IV.
24. Melfort, I.
25. Truro, I; Edmonton, IV.
28. Georgetown, IV; Onion Lake III; Oakbank.
29. Onion Lake, II; Melfort, II; Qu'Appelle, I; Minnedosa, I; Kingston, I; Quebec, IV; Haileybury, IV.
30. Sutton, Minnedosa, III.

Thunder recorded on :—

1. Truro, Belmont, Norquay, Beaver Hills W., Sutton, Bala, Bon Accord, Threehills Creek, Treherne, Quesnel, Bullion, Minnedosa.
2. Barnardo, Providence Bay, Crescent Lake, Hillview, Bowsman.
3. London, Gravenhurst, Ursa, Providence Bay, Emsdale, Beatrice, Bruce Mines, Bala, Minnedosa, White River, Port Arthur, Bowsman.
4. Deseronto, Lindsay, Sturgeon Falls, Wooler, Aurora, Lansdowne, Emsdale, Huntsville, Agincourt, Paris, Welland, Lakefield, Stony Creek, Erasmus, Belleville, Brome, Kingston, Port Stanley, Quebec, Woodstock.
5. Truro, Coutts, Arden, Port Hastings, St. Stephen, Welland, Sutton, Vankleek Hill, Princeton, Halifax, Grand Manan, St. John.
6. Truro, Gatesgarth, Aweme, Qu'Appelle, Swift Current, Medicine Hat, Halifax.
7. Truro, Belmont, Kuper Island, Rat Portage, Bermuda.
8. Truro, Pictou, Ursa, Port Stanley, Port Arthur.
9. London, Ursa, Nottawasaga, Midland, Wiarton, Emsdale, Brantford, Port Arthur, Owen Sound, Lucknow, Meaford, Clinton, Quesnel, Port Stanley, Saugeen.
10. London, Lindsay, Gravenhurst, Midland, Georgetown, Providence Bay, Emsdale, Huntsville, Agincourt, Haliburton, Paris, Birnam, Clontarf, Lakefield, Stony Creek, Meaford, Sutton, Erasmus, Bala, Point Clark, Shawinigan Falls, Brome, Port Stanley, Ottawa, Quebec, Saugeen, Parry Sound, Peterboro'.
11. Arden, Sutton.
12. Wiarton, Emsdale, Lakefield, Cockburn Island, Parry Sound.
13. Midland, Wyoming, Chicoutimi, Port Stanley.
14. Gravenhurst, Ursa, Emsdale, Haliburton, Birnam, Lakefield, Lucknow, Clinton, Erasmus, Bala.
15. London, Lindsay, Westminster, Sunshine, Ursa, Midland, Wiarton, Emsdale, Clinton, Beatrice, Haliburton, Birnam, Owen Sound, Clontarf, Lucknow, Meaford, Erasmus, Bala, Point Clark, Bissett, Parry Sound; Peterboro'.
16. London, Ursa, Georgetown, Aurora, Westport, Providence Bay, Wyoming, Emsdale, Beatrice, Kilmount, Agincourt, Clontarf, Stony Creek, Sutton, Rocklyn, Erasmus, Bissett, Parry Sound, Toronto.
17. Sunshine, Croydon, Sutton.

18. Westport.
19. Sunshine, Port Bobs.
21. Willow Bunch, Crescent Lake.
22. Barnardo, Savanne.
23. Barnardo, Ursa, Midland, Lansdowne, Emsdale, Beatrice, Clontarf, Erasmus, Bala, Belleville, White River, Parry Sound, Peterboro'.
26. Providence Bay, Lucknow, Cockburn Island.
27. Shawinigan Falls, Sherbrooke, Chicoutimi, Brome, Saugeen, Haileybury.
28. Pictou, Grand Manan, Yarmouth, St. John.
29. Barkerville.
30. Ursa.

FORECASTS FOR SEPTEMBER, 1903.

The forecasts issued by this office at 11 p.m. each night, are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of predictions issued during the month was 1117. These were divided as follows:—

DISTRICT.	No. Issued.	VERIFIED.			
		No. Fully	No. Partly	No. Not	Percentage
Manitoba.....	85	63	11	11	80.6
Lake Superior.....	107	80	22	5	85.0
Lower Lake Region.....	125	91	19	15	80.4
Georgian Bay.....	125	95	20	10	84.0
Ottawa Valley.....	116	97	14	5	89.7
Upper St. Lawrence.....	119	87	22	10	82.4
Lower St. Lawrence.....	107	88	15	4	89.3
Gulf.....	109	88	17	4	88.5
Maritime Provinces, West.....	112	87	13	12	83.5
Maritime Provinces, East.....	112	85	13	14	81.7
Total.....	1117	861	166	90	84.5

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART,
Director

Meteorological Office, Toronto,
26th October, 1903.

DEPARTMENT OF MARINE AND FISHERIES, CANADA.

METEOROLOGICAL SERVICE.



Monthly Weather Review.

VOL. XXVII.

OCTOBER, 1903.

No. 10.

INTRODUCTION

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the material used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

REMARKS UPON THE WEATHER.

In British Columbia the weather, although wet from the 3rd to 12th and 27th to 31st in most districts, was fine and dry during the intervening periods, the rainfall in the aggregate being unusually light. Throughout the month the daily maximum temperature was generally between 50 and 60 in most localities, and as usual frosts were more frequent and the daily range of temperature much greater over the upper mainland than in districts contiguous to the coast. Vegetation assumed a wintry appearance at a somewhat early date.

Throughout the North-west Territories, with a very few local exceptions, the weather was exceedingly fine, mild and dry, there being much sunshine and the rain or snow occurring being mostly light. In some districts in Alberta there was not any precipitation. Frosts were recorded almost nightly, but the temperature during the day frequently exceeded 60 and on several dates 70 was also exceeded at many stations. A few hardy plants were still in bloom late in the month, but the trees were denuded of leaves at a much earlier date.

The weather in Manitoba was quite similar to that in the Territories, it being mostly fine, mild and dry. At Minnedosa, St. Alban's and Barnardo, however, the precipitation was somewhat excessive. Quite low temperatures were recorded on or about the 17th and 26th, and there was little sign of life in vegetation after the former date.

In Ontario the weather was exceedingly fine and mild, and although somewhat wet in eastern and southern counties it was unusually dry in western, south-western and northern districts. During the first week the weather remained quite warm but on or about the 8th there was a marked change and frosts at night at inland stations were frequent after that date. On the 25th and 26th a gale occurred accompanied by low temperature and falls of snow at many places. On the 30th some wild and many garden plants were still in bloom, and in southern districts some trees still retained their leaves.

In the Province of Quebec the weather did not depart much from the normal but it was generally milder and drier than usual, the precipitation being very light in a few districts. Up to the 8th comparatively high temperatures prevailed but after that date there was a marked change and frosts at night were frequently recorded. Falls of snow were recorded at many places on or about the 26th but it soon disappeared. Trees were denuded of leaves early in the month.

The weather though somewhat mild and dry at most places in New Brunswick did not depart much from the normal. These conditions were more marked up to the 20th, after which lower temperatures prevailed and there was much more bright sunshine. Snow occurred late in the month at a few places and frosts were frequent after the 20th. Moderate gales were reported on the 18th, 23rd and 27th. Many trees retained their leaves until late in the month.

In Nova Scotia the weather varied somewhat with the district more especially with regard to the rainfall which in some places was above and in other places below the average. Much bright sunshine occurred during the first nine days also from the 20th to 26th, whilst there was much dull weather during the intervening periods. After the 21st frosts were general and snow was recorded on the 27th.

In Prince Edward Island, with the exception of a wet period from the 11th to 19th, also on or about the 1st, 24th and 27th the weather was unusually dry, whilst the sunshine which was more prevalent during the first and last week did not in the aggregate depart much from the normal. Somewhat cool weather was general, more especially after the 19th, when light frost was recorded occasionally. Vegetation was in normal condition. E. F. PAYNE.

ATMOSPHERIC PRESSURE.

The mean atmospheric pressure for October was subnormal over the greater portion of the North-west Territories, Manitoba, Lake Ontario, the St. Lawrence Valley east to Quebec City, and also over the western portion of Nova Scotia, elsewhere the average was exceeded. The range of departure was 0.14 of an inch, the extremes being + 0.07 of an inch at New Westminster, B.C., and - 0.07 of an inch at Prince Albert, N.W.T.

HIGH AREAS.

The Highs during October were on the whole comparatively unimportant. Only one, and that quite at the end of the month was first observed, in the Canadian North-west Territories, and this alone was of a late autumn type, and moving southeastward, while a low area skirted the Atlantic coast; it brought the first severe frost in Ontario and Quebec. Nearly all other areas were first observed over the North Pacific or far Western States. Those which passed eastward, diminished in energy over the Great Lakes and Middle States, but during the first half of the month there was a tendency for increased pressure over the Gulf of St. Lawrence and Maritime Provinces.

LOW AREAS.

A feature of the month as regards the low areas was the fact that of twelve areas, eight either moved into Canada across British Columbia or were first observed over the North-west Territories. Only one of these, however, that which gave an exceedingly low barometer reading from the Rockies, was very pronounced. The others, many of them accompanied by light precipitations had a marked tendency to give continued southwest and westerly winds with mild weather. A pronounced and rapid development of a North-west area, apparently reinforced by a secondary occurred on the 3rd, and a heavy gale resulted on Lake Superior; the storm however dispersed as quickly as it had developed.

A very important area was first observed over the American Middle Atlantic States on the 8th, and then for several days hovered off the coast, its accompanying rain area extending northward into the St. Lawrence and Ottawa Valleys; subsequently, on the 11th and 12th, it gave rain and moderate gales in the Maritime Provinces.

A marked and rapid development of what had appeared to be an unimportant low occurred north of the St. Lawrence Valley on the 25th, while at the same time a fairly deep depression which may have had a tropical origin was moving northeastward some distance off the Atlantic Coast. These areas, together with the important high mentioned above, caused heavy gales on the Great Lakes and St. Lawrence, and more moderate gales with rain further east.

WINDS.

In Vancouver Island and over the mainland of British Columbia the direction favoured the south and west but there were many days when it was variable. Strong breezes were recorded on five occasions, fresh on nine, and the force of a gale twice.

In the North-west Territories the direction was chiefly confined to the south and west. There were twelve days with strong breezes, eleven with fresh, and two gales.

In Manitoba the direction was mainly between south and west. Strong breezes were experienced on nine days, fresh on eleven, and there were four gales.

In the Lake Region the direction was nearly altogether between southwest and northwest with nine days of strong breezes, eleven of fresh, and four gales.

In the Ottawa and Upper St. Lawrence Valleys the direction was also chiefly between the southwest and northwest. Strong breezes were recorded on nine days, fresh on nineteen, and four gales.

In the lower St. Lawrence Valley and the Gulf the south and west directions predominated; strong breezes prevailed on five days, fresh on fifteen and there were three gales.

In the Maritime Provinces the south and west directions were chiefly in evidence. Strong breezes prevailed on five days, fresh on nineteen and there were three gales.

The heaviest gale of the month in the Lake Region was experienced between the 24th and 26th, and this was not warned. The other gales occurring in the Lake Region as well as elsewhere were however warned, but on two occasions, on the Lakes as well as in the Maritime Provinces, the display of warning signals was hardly justified by subsequent dangerous winds except very locally.

TEMPERATURE.

This temperature was above the average over the Dominion, except in British Columbia and in the extreme eastern portions of the Maritime Provinces. The positive departures were, as a rule, pronounced, especially in Manitoba and the North-West Territories, where they ranged from 4 to 7 degrees; also in the Peninsula of Ontario, where in many localities they were from 3 to 4 degrees. The negative departures did not exceed 2 degrees in British Columbia, and only 1 degree in the Maritime Provinces.

The Highest and Lowest temperatures in each Province during October, 1906, were:

British Columbia,	74° 0 on 13 at Quesnel.	12° 0 on 4th at Barkerville.
North-west Territories,	83° 0 on 13th at Medicine Hat.	11° 0 on 17th at Indian Head.
Manitoba,	74° 0 on 13th at Dauphin.	14° 0 on 17th at Brandon.
Ontario,	80° 0 on 7th at Stony Creek.	6° 0 on 27th at Kilmount.
Quebec,	74° 0 on 8th at Perce.	19° 0 on 28th at St. Agathe.
New Brunswick,	73° 1 on 1st at St. Stephen.	20° 0 on 22nd at St. Stephen.
Nova Scotia,	71° 5 on 6th at Halifax.	20° 8 on 31st at Truro.
Prince Edward Island,	68° 3 on 1st at Charlottetown.	29° 0 on 29th at Hamilton.

PRECIPITATION.

The precipitation was below the average in nearly all portions of Canada, except locally, these exceptions being Ontario, south and east of the Georgian Bay district to the boundary, Montreal and its vicinity, Nova Scotia, and a few isolated places in Manitoba, Saskatchewan and Alberta. The most general marked deficiency, amounting to an inch and over, occurred in the Province of Quebec; elsewhere the negative departures varied from one to nine-tenths of an inch.

BRIGHT SUNSHINE.

The amount of Bright Sunshine recorded in Quebec and the Maritime Provinces was subnormal whilst elsewhere in Canada, with local exceptions in Ontario and the Northwest Territories, the average was exceeded. A positive departure of 17% occurred at Brandon, Manitoba, where 54% of the possible amount was recorded.

THE EFFECTS OF TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, OCTOBER, 1903.

• Requirements for not requiring to sign a contract

[illegible]

PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, OCTOBER, 1903.

a Barometer not reduced to Sea Level. * Stations not furnished with Registering Thermometers.

STATION	Latitude N.	Longitude W.	PRESSURE.			TEMPERATURE.				No. of days completely clouded.	DIRECTION OF WIND FROM								VELOCITY OF WIND.			PRECIPITATION.			No. of fair days.	No. of showers.	No. of fogs.								
			Mean reduced.	Highest.	Lowest.	Range.	Mean.	Difference from average.	Years observed.		Highest.	Date.	Lowest.	Date.	Mean daily range.	Mean relative humidity.	Mean amount of cloud.	N.	N.E.	E.	S.E.	S.W.	W.	N.W.				Total number of observations.	Mean miles per hour.	Highest days velocity.	Force and direction from.	Amount.	Billion feet from average.	Heaviest fall in month.	Days with 1/4 or more.
OSWEGO, Ont.	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Hamilton	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Port Hope	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Kingston	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Cochran Island	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Chatham	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Medford	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Westford	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Brace Mines	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Rat Portage	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Brumville	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Brum Bay	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Surgeon Falls	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Urbana	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Toronto	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Welland	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Peterborough	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Lindsay	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Doswell	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Lakefield	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Ridge town	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Kings town	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Ontario	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Mississ.	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Carleton	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Stratford	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Lacknow	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
White River	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Port Arthur	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Stony Creek	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Grandville	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Windsor	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Alton	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Georgetown	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
North Bruce	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Collingwood	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Rocklyn.	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Bad.	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Orillia	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Sauguen	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
St. Catharines	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40	1	1	5	17	17	2	1	62			10.7	10.7	0.0	0.0	3	3		
Bloomfield	43 13	79 51	30.3				31.6	+1.5	27.8	8	15.2	15.4	5.5	15.5	75	9	40</																		

PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c., DURING
OCTOBER, 1903.

STATIONS.	RAINFALL.					SNOWFALL.				REMARKS.
	Amount in inches.	No. of Days '01 or Over.	No. of Fair Days.	Heaviest Fall in Month	Date.	Amount in inches.	No. of Days.	Heaviest Fall in Month	Date.	
BRITISH COLUMBIA—	in.			in.		in.		in.		
Sooke Lake	5.08	13	18	0.95	4	1st. first frost; fog 19th, 20th, 24th, 25th.
Royal Oak	3.51	11	20	1.20	5	.....	.....	.....	.....
Kuper Island	3.90	10	21	1.07	5	.....	.....	.....	.....
Nanaimo	3.21	8	23	1.59	10	.....	.....	.....	.....
Goldstream Lake	4.79	10	21	1.56	5	.....	.....	.....	.....
Port Essington	25.09	26	5	2.90	12	Flowers to end of month.
Naas Harbour	22.27	24	7	3.75	11	.....	.....	.....	.....
N. W. TERRITORIES—										
Whitewood	0.45	6	25	0.22	7	Aurora 12th, 13th, 21st, 25th, 26th, 30th, 31st.
Innisfail	0.04	2	29	0.04	13	.....	.....	.....	.....
Count's	0.10	1	30	0.10	1	.....	.....	.....	.....
Dirt Hills	0.53	4	26	0.42	6	1.0	1	1.0	7	
Lacombe	1.80	4	25	0.80	19	1.8	2	1.8	2	
Salteoats	0.50	4	27	0.10	2	Thunder 21st.
Bruderheim	0.48	4	27	0.33	11	1.0	1	1.0	2	
Foxleigh	1.08	6	24	0.56	8	.....	2	.....	3
Beaver Hills, W.	0.41	5	24	0.22	11	4.0	2	4.0	23	
Stirling	none					.....	.....	.....	.....
Regina	0.27	5	24	0.11	5	6.0	2	6.0	6	Thunder 21st.
Beaver Hills, E.	0.62	3	27	0.22	21	2.0	2	2.0	2	
MANITOBA—										
Beaver	0.95	2	29	0.95	1-2	Thunder 2nd, 7th. Thunder 2nd, 5th, 6th.
Norquay	2.22	5	26	1.35	7	.....	.....	.....	.....
Belmont	2.23	7	24	1.63	1-2	Thunder 2nd, 6th. Thunder 2nd, 7th. Thunder 2nd, 6th.
Cartwright	1.37	4	27	0.64	6	.....	.....	.....	.....
Gretna	0.88	4	27	0.68	6-7	.....	.....	.....	.....
Rathwell	1.69	6	23	0.92	2	.....	.....	.....	.....
Morden	1.52	4	25	1.10	6-7	.....	.....	.....	.....
Rapid City	1.50	2	26	0.80	7	Thunder 2nd. Indian Summer 24th, 31st.
Moreton	1.20	6	25	0.60	7	.....	.....	.....	.....
White Water	1.45	6	25	0.58	6	.....	.....	.....	.....
ONTARIO—										
Warton	2.26	10	21	1.09	7	Thunder 7th.
Orangeville	3.71	5	26	1.76	2	.....	.....	.....	.....
Lion's Head	2.88	12	19	1.21	8	Thunder 7th, 9th.
Sunshine	3.64	9	21	1.81	9	0.1	1	0.1	26	
Prince-ton	2.74	6	25	1.81	7-8	.....	.....	.....	.....
Lansdowne	1.99	6	25	0.65	7	.....	.....	.....	.....
Arden	1.76	11	20	0.54	8	.....	1	.....	26
Westminster	2.32	7	24	0.87	1	1	26	Thunder 16th. Thunder 7th, 15th.
Lynsloch	2.59	6	25	1.63	8	.....	.....	.....	.....
Uxbridge	2.35	10	21	0.93	8	1	25	Thunder 15th, 17th. Thunder 15th, 16th.
Wyoming	2.56	5	26	1.30	7	.....	.....	.....	.....
Sydenham	2.22	8	23	0.72	8	1	26	Thunder 31st.
Oliver's Ferry	4.50	7	24	2.75	17	Thunder 31st.
Croydon	1.15	4	26	0.75	8	.....	.....	.....	.....
Parma	1.84	7	23	0.79	8	2.0	1	2.0	28	Thunder 31st. Thunder 31st.
Jermyn	1.91	6	24	0.70	8	2.0	1	2.0	27	
Smith's Falls	2.13	6	24	1.49	9	0.5	1	0.5	26	Thunder 31st.
Ensdale	4.63	12	18	1.83	8	.....	3	.....	27
Goderich	2.82	7	24	0.60	26	Thunder 1st, 7th, 15th, 17th.
Georgetown	2.55	8	16	0.86	8	.....	1	.....	26
Deer Park	2.57	7	23	0.77	8	0.8	1	0.8	26	Thunder 8th. Thunder 15th, 17th.
Port Burwell	2.57	7	23	1.68	7	.....	1	.....	26
Aurora	1.51	8	22	0.94	7	4.3	1	4.3	26	Thunder 7th, 15th, 17th.
Nottawasaga Island ..	1.90	7	21	0.80	17	.....	4	.....	26
Woods	0.93	5	25	0.74	8	1.0	1	1.0	26	Thunder 7th, 15th.
N. Williamsburg	3.67	11	19	2.93	8-9	.....	1	.....	19
Midland	2.63	8	22	1.25	7	1	26	Thunder 7th, 15th.
Smith's Falls	2.37	5	25	1.38	10	.....	1	.....	26
Ennisville	1.69	4	26	0.70	17	2.0	1	2.0	27	Thunder 7th, 15th, 17th and 30th.
Watford	2.65	6	25	1.72	7	.....	.....	.....	.....
Scarboro'	2.30	7	22	0.78	7	1	26	Thunder 1st, 15th, 31st. Thunder 7th, 15th, 31st.
Dedtown	2.07	3	28	1.25	7	.....	.....	.....	.....
Providence Bay	1.33	7	24	0.51	8	Thunder 1st, 15th, 31st. Thunder 7th, 15th, 31st.
Versa	2.33	7	24	0.80	7	.....	.....	.....	.....
Huntsville	3.75	6	24	1.39	8	0.5	1	0.5	26	Thunder 7th, 15th, 31st.
Westport	2.00	13	17	0.50	8	.....	1	.....	24
Dutton	2.31	5	25	1.62	8	2.0	1	2.0	26	
Niagara	2.15	7	24	1.20	8	
NEW BRUNSWICK—										
Point Esquimaux	2.38	9	22	1.04	18	1	29	
NOVA SCOTIA—										
Port Morden	1.86	11	20	1.33	11	

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE
SUN WAS ABOVE THE HORIZON IN THE MONTH OF OCTOBER, 1903.

	Hours Ending															
	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.
Victoria			0.03	0.14	0.27	0.45	0.47	0.50	0.59	0.67	0.54	0.43	0.11			
Nanaimo			0.00	0.17	0.39	0.48	0.55	0.58	0.64	0.59	0.49	0.53	0.25			
Agassiz			0.00	0.03	0.15	0.35	0.43	0.51	0.54	0.55	0.49	0.42	0.11			
Battleford			0.05	0.33	0.56	0.55	0.64	0.68	0.62	0.53	0.45	0.36	0.03			
Indian Head			0.00	0.01	0.44	0.58	0.76	0.77	0.74	0.72	0.73	0.64	0.19			
Brandon			0.00	0.02	0.48	0.73	0.78	0.77	0.79	0.74	0.69	0.60	0.26			
Winnipeg			0.00	0.23	0.51	0.61	0.66	0.70	0.73	0.71	0.63	0.53	0.21	0.01		
Woodstock			0.00	0.11	0.54	0.63	0.65	0.64	0.62	0.62	0.59	0.47	0.14			
Toronto			0.00	0.22	0.47	0.69	0.69	0.65	0.63	0.61	0.60	0.55	0.31			
Lindsay			0.03	0.20	0.37	0.54	0.58	0.63	0.59	0.54	0.50	0.37	0.34	0.08		
Barrie																
Gravenhurst			0.00	0.35	0.55	0.54	0.52	0.46	0.51	0.54	0.52	0.50	0.40	0.11		
Kingston			0.00	0.19	0.43	0.56	0.59	0.55	0.50	0.49	0.49	0.46	0.14			
Ottawa			0.00	0.10	0.36	0.44	0.51	0.47	0.47	0.56	0.53	0.43	0.19			
Montreal			0.01	0.17	0.37	0.45	0.49	0.46	0.44	0.45	0.43	0.30	0.06			
Quebec			0.00	0.13	0.32	0.34	0.36	0.43	0.43	0.41	0.40	0.35	0.25	0.02		
Fredericton			0.19	0.38	0.46	0.44	0.46	0.49	0.40	0.46	0.37	0.23	0.02			

	Victoria.	Nanaimo.	Agassiz.	Battleford.	Indian Head.	Brandon.	Winnipeg.	Woodstock.	Toronto.	Lindsay.	Barrie.	Gravenhurst.	Kingston.	Ottawa.	Montreal.	Quebec.	Fredericton.
Mean proportion for month. (Constant sunshine being 1.)	0.39	0.43	0.33	0.44	0.51	0.54	0.51	0.46	0.49	0.43		0.45	0.40	0.37	0.38	0.31	0.36
Difference from average.....	+ 0.03	—	+ 0.04	+ 0.03	+ 0.15	+ 0.17	+ 0.14	+ 0.07	+ 0.06	0.06		—	— 0.01	+ 0.02	0.03	—	0.08
Maximum daily amount	0.81	0.80	0.72	0.93	0.86	0.90	0.92	0.84	0.88	0.96		0.94	0.84	0.85	0.94	0.88	0.87
Date	16	23	22	24	31	25	25	28	12	21		21	13	21	2	2	6
No. of days completely clouded	4	6	12	1	2	1	4	7	1	6		4	5	5	6	6	9

Aurora recorded :—

Where the class of aurora is noted by the observer, it is given, (I) being the brightest, (IV) the feeblest in brilliancy.

10. Haileybury, IV.

11. Haileybury, IV : Sturgeon Falls, Moose Jaw, Calvin.

12. Renfrew, II : Barnardo, Deseronto, II : Lindsay, I : Haileybury, I : London, II : Gravenhurst, I : Emsdale, *very brilliant* : Georgetown II : Midland, Scarboro, Ursa, Huntsville, II : Cartwright, Regina, W. Beaver Hills, III : Cape Chatte, II : Chicoutimi, Oakbank, Bruce Mines, I : Cockburn Island, Cottam, Wesley, Winnipeg, II : Aweme, III : Beatrice, II : Savanne, *very brilliant* : Peterboro, *very bright* : Clontarf, I : Prince Albert, I : Toronto, II : Clinton, II : White River, I : Rocklyn, III : Belleville, *very fine* : Father Point, II : Ottawa, III, Estevan, III : Bissett, III : Saugeen, I : Port Stanley, III : Parry Sound, I : Kingston, IV : Quebec, III : Minnedosa, I : Hamilton, Coldwater, *very fine* : Haliburton, Port Dover, Brantford, II : Welland, I : Rat Portage, IV : Meaford, Bala, *very brilliant* : Swift Current, IV.

13. Haileybury, II : Gravenhurst, IV : Emsdale, II : Georgetown, IV : Midland, Ursa, Huntsville, IV : Cartwright, Moreton, Regina, Beaver Hills W. II : Aweme, II : Savanne, Rocklyn, IV : Sutton, *very brilliant* : Vankleek Hill, *very fine* : Father Point, II : Ottawa, IV : Bissett, III : Montreal, I : Kingston, IV : Minnedosa, II : Edmonton, Birnam, III : Haliburton, Brantford, IV : Rat Portage, IV : Bruce Mines, III : Wesley, Meaford, Estevan, II : Gatesgarth, Qu'Appelle, III : Winnipeg, III : White River, II.

14. Midland, Ursa, Vankleek Hill, Minnedosa, Edmonton, IV.

17. Haileybury, III : Wetaskiwin, Estevan, Gray Hill, IV.

20. Haileybury, IV.

25. Georgetown, IV : Beaver Hills W., IV : Aweme, III : Minnedosa, IV : Gray Hill, IV : Moose Jaw : Battleford, IV : Prince Albert, I.

26. Haileybury, IV, Gravenhurst, IV : Georgetown, IV : Beaver Hills W., IV : Aweme, IV : Minnedosa, IV : Edmonton, IV : Gray Hill, IV : Battleford, IV : Swift Current, I : Prince Albert, III.

27. Lindsay, I : Estevan, IV : Battleford, IV.

28. Haileybury, IV : Estevan, IV : Gleichen.

29. Brandon, III, Edmonton, IV : Estevan, IV : Chaplin, I.

30. Truro, II : Midland, Rapid City, *very brilliant* : Moreton, Beaver Hills W., I : Cape Chatte, II : Brandon, I : Aweme, I : Savanne, *very brilliant* : Rat Portage, II : Wetaskiwin, Estevan, III : Crescent Lake, Chaplin, II : Battleford, IV : Swift Current, IV : Winnipeg, I : Prince Albert, II.

31. Pictou, Truro, II : Lindsay, III : Haileybury, I : Gravenhurst, III : Emsdale, II : Midland, Huntsville, II : Cartwright, *very fine* : Morden, *magnificent* : Rapid City, Beaver Hills W., I : Sussex, St. Stephen, Moncton, Cape Chatte, III : Quesnel, Oakbank, *fine display* : Charlottetown, III : Halifax, IV : Grand Manan, IV : St. John, II : Victoria, IV : Aweme, I : Savanne, Rocklyn, II : New Westminster, II : Sable Island, II : Saugeen, IV : Montreal, IV : Minnedosa, I : Edmonton, II : Estevan, I : Gray Hill, II : Birnam, III : Coldwater, *very fine* : Rat Portage, I : Bruce Mines, Cockburn Island, Wesley, Meaford, Bala, Wetaskiwin, Crescent Lake, Knee Hill, Toronto, IV : Indian Head, Banff, III : Qu'Appelle, I : Battleford, II : Swift Current, IV : Winnipeg, I : White River, II : Port Arthur, II : Prince Albert, III : St. John, I : Calvin.

Thunder recorded on :—

1. Stony Creek, Lucknow, Paris, Point Clark, Birnam, Toronto, London, Port Stanley, Parry Sound, Emsdale, Georgetown, Midland, Ursa, Quesnel, Agincourt, Clinton, Meaford, Wesley, Rat Portage, Welland.

2. Stony Mountain, Norquay, Belmont, Cartwright, Gretna, Rathwell, Morden, Moreton, Oakbank, Aweme.

3. Cockburn Island, Bruce Mines, Port Arthur.

4. Parry Sound, Haliburton, White River, Port Arthur.

5. Regina.

6. Minnedosa, Belmont, Gretna, Morden, Sunshine, Savanne.

7. Haileybury, London, Gravenhurst, Port Stanley, Parry Sound, Norquay, Rathwell, Warton, Westminster, Georgetown, Midland, Scarboro, Westport, Dutton, Agincourt, Rocklyn, Clinton, Wesley, Bruce Mines, Lucknow, Port Dover, Owen Sound, Paris, Hamilton, Birnam, Toronto, St. Catharines, Calvin.

8. Port Stanley, Port Burwell, Dutton, Bala, Sutton, Calvin.

9. Sunshine.

12. Sable Island, Bermuda.

15. Lindsay, London, Gravenhurst, Port Stanley, Parry Sound, Westminster, Uxbridge, Wyoming, Georgetown, Aurora, Midland, Scarboro, Ursa, Huntsville, Agincourt, Beatrice, Toronto, Belleville, Rocklyn, Meaford, Welland, Stony Creek, Lakefield, Lucknow, Port Hope, Brantford, Port Dover, Owen Sound, Paris, Point Clark, Hamilton, Birnam.

16. Deseronto, Port Stanley, Wyoming, Bala, Sutton, Welland, Brantford.

17. Lindsay, Toronto, Yarmouth, Grand Manan, Saugeen, Uxbridge, Emsdale, Sussex, Georgetown, Aurora, Scarboro, Agincourt, Lakefield, Owen Sound, St. John

18. Sutton.

20. Bermuda.

21. Edmonton, Beaver Hills E.

30. Scarboro.

31. Gravenhurst, Sydenham, Ursa, Huntsville, Beatrice, Bala, Wesley.

FORECASTS FOR OCTOBER, 1903.

The forecasts issued by this office at 11 p.m. each night, are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of predictions issued during the month was 1174. These were divided as follows :—

DISTRICT.	No. Issued.	VERIFIED.			
		No. Fully	No. Partly	No. Not	Percentage
Manitoba.....	94	17	17	3	81.8
Lake Superior.....	102	21	21	8	87.7
Lower Lake Region.....	134	111	17	6	89.2
Georgian Bay.....	134	116	16	2	92.6
Ottawa Valley.....	118	99	15	4	90.2
Upper St. Lawrence.....	119	97	19	3	89.5
Lower St. Lawrence.....	118	90	19	9	84.3
Gulf.....	119	94	17	8	86.1
Maritime Provinces, West.....	118	88	21	9	83.4
Maritime Provinces, East.....	118	88	23	7	84.3
Total.....	1174	930	185	58	87.1

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART,

Director

Meteorological Office, Toronto,
26th November, 1903.

DEPARTMENT OF MARINE AND FISHERIES, CANADA

METEOROLOGICAL SERVICE.



Monthly Weather Review.

VOL. XXVII.

NOVEMBER, 1903.

No. 11.

INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the material used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

REMARKS UPON THE WEATHER.

The weather over the lower mainland and islands of British Columbia was exceedingly dull, stormy and wet, rain or snow falling on twenty days or more in most districts; it was also quite cold from the 10th to 25th, frosts occurring almost every night. Over the upper mainland it was comparatively mild, and the precipitation was generally very much less than in districts further westward, whilst the sunshine was deficient. Snow was somewhat frequent from the 10th to 20th but it soon disappeared on the lower lands.

In the North-west Territories the weather was unusually mild during the first ten days, but on the 11th there was a rapid fall in temperature, and by the 18th it had fallen much below zero. Cold weather continued to the 25th, when it turned somewhat milder again. The precipitation which was comparatively heavy in most localities was chiefly snow, and on the 30th still covered the ground. Sleighing was possible late in the month in some districts.

The weather in Manitoba was quite similar to that in the Territories, comparatively high temperatures continuing to the 11th when it turned quite cold, the ground and rivers becoming frozen and temperatures well below zero being recorded a few days later.

The weather in Ontario was exceptionally mild up to the 18th when quite wintry conditions set in, and it then continued unusually cold to the end of the month. Much bright sunshine occurred throughout the month, but from the 12th to 24th showers were somewhat frequent. The precipitation which was light was mostly rain up to the 15th and snow during the second half of the month. At most lake ports navigation continued open to the 30th, the harbours being almost free of ice. At Collingwood the snowfall of the month was phenomenally heavy, a depth of 48 inches being recorded.

In the Province of Quebec the weather was quite mild during the first half of the month when there was more sunshine and precipitation was less frequent than during the latter half. On or about the 15th there was a marked fall in the temperature and the weather continued cold to the 30th, light falls of snow occurring frequently during this period.

The weather in New Brunswick, as in Quebec, was quite mild during the first half of the month and cold during the second half. Cloud and sunshine alternated frequently throughout the month, and from the 6th to 19th falls of rain or snow were of frequent occurrence. On or about the 20th temperatures below zero were recorded at many places and lakes and rivers were frozen.

In Nova Scotia the weather conditions were somewhat similar to those in Quebec and New Brunswick excepting that it was not quite so cold during the second half of the month. Much cloudiness prevailed and falls of rain or snow were frequent, the precipitation in the aggregate being unusually heavy.

The weather in Prince Edward Island was characterised by heavy rains which were of frequent occurrence. Somewhat high temperatures prevailed up to the 16th when the weather became quite cold and continued so almost without interruption to the end of the month. On the 30th harbours and rivers were still free of ice.

—F. F. PAYNE.

ATMOSPHERIC PRESSURE.

Atmospheric pressure was subnormal from Eastern Ontario to the Maritime Provinces and exceeded the average in all other districts. There was a range of 0.21 of an inch: the extremes being +0.09 at Medicine Hat and Swift Current, N.W.T., and -0.12 at Halifax, N.S.

HIGH AREAS.

Nine areas of high pressure were traced during the month, several of the number being of pronounced proportions. The general path of the areas was either from the far North-west in Canada or else from the North Pacific United States, across the continent: the systems usually drawing well to the southward in their eastward advance and eventually passing off the Atlantic Coast south of the 40th parallel.

No. 2 travelled between the 3rd and 9th from the North-west Territories over the Lake Region and off the Middle Atlantic United States coast. It was chiefly noticeable for the un-reasonably mild weather accompanying it, the lowest temperature in Manitoba being 16°, and in Ontario and Quebec a few degrees of frost only.

Nos. 4 and 5 were the pronounced anti-cyclones of the month. The former lay in the North-west Territories from the 12th to the 16th, then between the 16th and 22nd, spread over the continent, the pressure being usually from 30.60 inches to over 30.90 inches reduced to sea level. During its presence much cold weather prevailed: in fact it might almost be said to have ushered in winter over Canada. In the North-west Territories and Manitoba between the 14th and 19th the temperature ranged from zero to 20 degrees below and on the 20th Bissett in the Upper Ottawa Valley recorded 12 below zero, the minimum temperature of the month in that locality. No. 5 appears to have originated in the North Pacific States. Its course was into Manitoba where it was centred from the 23rd until the 25th, when it drew slowly southwards to the region of the Gulf of Mexico where it quickly diminished. It brought the coldest weather of the month over the larger part of Canada. Winnipeg recorded 26° below zero on the 24th and 28° below on the 25th: while on the 26th Toronto temperature fell to 6°: Ottawa, Montreal and Quebec 4° and Chatham, N.B. 2°, being the lowest temperatures of the month at these places.

LOW AREAS.

Sixteen areas of depression were charted during the month, six first appearing in the North-western portion of the continent, four in the western portion and six off the United States Atlantic Coast.

Several of the North-west lows were important while over British Columbia, but broke up before reaching the lakes. The Western lows likewise with one exception diminished in their eastward advance, while of the Atlantic lows, some either moved or backed into the Maritime Provinces and others passed at a distance from the Nova Scotian Coast making the general pressure movements of the month in many respects very complex.

No. 2 caused a severe storm over British Columbia at the beginning of the month: also No. 5 on the 9th, No. 7 on the 11th, and No. 9 between the 12th and 14th, all gave very stormy conditions in that Province.

On the 7th there was heavy snow in parts of Quebec and snow and rain over the Maritime Provinces together with fresh gales attendant upon low area No. 3, a disturbance which passed over Eastern Canada from the Atlantic Ocean. No. 7 which first appeared on the North Pacific United States Coast brought, on the 11th, fresh gales and moderate rainfalls to the Lake Region. Nos. 13 and 14 were two of the most pronounced areas of the month: the former traversed Canada from Coast to Coast between the 19th and 24th, coalescing with No. 14 in the Maritime Provinces, the latter having meanwhile travelled up the Atlantic far off the United States Coasts. During the presence of these disturbances there was a considerable quantity of rain and snow in most parts of Ontario, Quebec and the Maritime Provinces together with fresh to heavy gales, the gales being more severely felt on the Great Lakes and in the Gulf of St. Lawrence than elsewhere.

WINDS.

In Vancouver Island and over the mainland of British Columbia the direction was largely confined to the south and east. There were five days with strong and nine with fresh breezes and five gales.

In the North-west Territories the south and west directions predominated with twelve days of strong and fourteen of fresh breezes and two gales.

In Manitoba the south and west directions were the most frequent. Strong breezes were experienced on seventeen days, fresh on five and there were two general gales.

In the Lake Region the direction was chiefly westerly with seven days of strong and seven days of fresh breezes and six gales, the heaviest storm occurring on the 23rd and the two next in order being those of the 11th and 16th.

In the Ottawa and Upper St. Lawrence Valleys the direction was mainly between the south and west. There were nine days of strong and eleven of fresh breezes and five gales.

In the Lower St. Lawrence Valley and the Gulf the direction was mostly westerly to northerly. Strong breezes were recorded on seven occasions, fresh on twelve, and there were eight gales, the heaviest storm being that of the 23rd, and the next in order the gale on the 7th.

In the Maritime Provinces the direction was also mostly westerly to northerly. Strong breezes prevailed four days, fresh fourteen, and there were seven gales, the principal gales being those of the 7th, 17th and 23rd.

The warnings which had been displayed in the St. Lawrence Valley and the Maritime Provinces prior to the 7th were ordered down some hours before the storm of the 7th commenced, so this storm was practically not warned. The moderate gales of the 28th and 29th in the St. Lawrence Valley and the Maritime Provinces were in some localities warned late, and on the 27th the Lakes were warned for a storm which did not mature except on Lake Superior where it was felt to a considerable extent.

With the exceptions noticed the storms were all warned.

The steam barge "Seattle" left Parry Sound on the 11th, ignoring the fresh gale signals then flying, and was driven ashore on Green Island, becoming a total wreck.

The schooner "Emerald," which was lost on Lake Ontario with all hands, left an American port in the face of an anticipated storm, warnings being ordered that afternoon and night by the United States Weather Bureau as well as by the Canadian Service for all Lake Stations. Had the Master of the "Emerald" consulted the Official Weather Bureaus instead of relying on his own weather judgment, the vessel would probably have remained in port.

TEMPERATURE.

The mean temperature of the first ten days of November was above the average in all parts of Canada and several days were phenomenally warm. On the 11th, hard-freezing set in over the Territories, and wintry conditions continued until the close of the month. It was not until the 18th, however, that a pronounced change occurred in Ontario and Quebec, and several days later in the Maritime Provinces. The largest positive departures from average, about 3°, occurred in Saskatchewan and parts of Nova Scotia, and the largest negative, also about 3°, in Southern Alberta and Southwestern Ontario.

The Highest and Lowest temperatures in each Province during November, 1903, were:

British Columbia,	68°·0 on 1st at Quesnel.	—18°·6 on 17th at Tobacco Plains.
North-west Territories,	77°·0 on 2nd at Swift Current	—38°·0 on 19th at Macleod.
Manitoba,	75°·0 on 1st at Almasippi.	—26°·0 on 25th at Fort Osborne.
Ontario,	75°·0 on 2nd at Cottam.	—26°·5 on 25th at White River.
Quebec,	60°·2 on 4th at Sherbrooke.	—0°·5 on 21st at Shawinigan Falls.
New Brunswick,	64°·0 on 5th at St. Stephen.	—6°·0 on 21st at Sussex.
Nova Scotia,	67°·2 on 4th at Halifax.	9°·5 on 22nd at Truro.
Prince Edward Island,	73°·0 on 8th at Hamilton.	17°·0 on 26th at Hamilton.

PRECIPITATION.

The precipitation was excessive and chiefly in the form of rain both in British Columbia and the Maritime Provinces, the largest quantities reported being 12·4 ins. at New Westminster, 12·3 in. at Chilliwack, 17·4 in. at Vancouver, 15·6 in. at N. Nicomen, 25·7 in. at Clayoquot, 23·8 in. at River Inlet, 15·0 in. at Coquitlam, 14·0 in. at Sooke Lake, B.C., 9·6 in. at Halifax, 7·6 in. at Grand Manan, 7·3 in. at Truro, 7·4 in. at Pictou, 9·4 in. at Port Hastings, 8·2 in. at Windsor, 7·9 in. at Charlottetown. In all the intervening Provinces and in the Territories the rainfall was scant and the snowfall not large.

At the close of the month nearly all portions of Ontario, Quebec and New Brunswick were snow covered, but in only a few districts on the higher lands was the depth sufficient to make good sleighing. Manitoba and the northern portions of the Territories were also covered, as were also parts of Prince Edward Island.

In the North-West Territories and Manitoba the ice on ponds and small lakes was from 6 to 11 ins. in thickness and in Ontario and Quebec from 3 to 6 ins., and navigation of canals and harbours was hampered.

At Collingwood the snowfall of the month was phenomenally heavy, a total depth of 48 ins. being recorded.

BRIGHT SUNSHINE.

Bright sunshine was below the average amount over the greater part of British Columbia, also at Fredericton in New Brunswick while in the North-west Territories, Manitoba, Ontario and Quebec, the average was everywhere exceeded and considerably so over Ontario, Toronto recording a positive departure of 18 per cent, Kingston 15 per cent and Lindsay 14 per cent. The percentage of the possible amount ranged from 4·9 at Nanaimo to 46 at Toronto.

TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, NOVEMBER, 1963

a Barometer not reduced to Sea Level. * Stations not furnished with Registering Thermometers.

STATION.	PRESSURE.			TEMPERATURE.				DIRECTION OF WIND FROM.				VELOCITY OF WIND.			PRECIPITATION.		
	Mean, minimum, and maximum.			Mean, minimum, and maximum.				Mean, minimum, and maximum.				Mean, minimum, and maximum.			Mean, minimum, and maximum.		
	Bar.	Therm.	Therm.	Bar.	Therm.	Therm.	Bar.	Therm.	Therm.	Bar.	Therm.	Therm.	Bar.	Therm.	Therm.		
British Columbia	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Vancouver	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Victoria	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Abbotsford	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Fraser Canyon	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Prince George	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Fort St. John	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Fort Chipewyan	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Fort McMurray	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Fort Resolution	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Fort Smith	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Fort Reliance	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Fort Simpson	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Fort Resolution	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Fort Smith	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Fort Reliance	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Fort Simpson	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Fort Resolution	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Fort Smith	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Fort Reliance	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Fort Simpson	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Fort Resolution	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Fort Smith	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Fort Reliance	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Fort Simpson	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Fort Resolution	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Fort Smith	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
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Fort Reliance	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
Fort Simpson	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		
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N. W. TERRITORIES. 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PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c., DURING
NOVEMBER, 1903.

STATIONS.	RAIN FALL.					SNOWFALL.				REMARKS.
	Amount in inches.	No. of Days of or Over.	No. of Fair Days.	Heaviest Fall in Month	Date.	Amount in inches.	No. of Days.	Heaviest Fall in Month	Date.	
BRITISH COLUMBIA—	in.			in.		in.		in.		
Nanaimo	8.77	18	11	1.65	13	7.5	3	5.0	16	
Goldstream Lake	11.07	18	4	1.47	6	31.0	8	13.5	11	
Royal Oak	7.81	24	6	0.83	10	1.5	2	1.0	10	
Copitlam	15.04	23	6	2.90	30	2.0	4	1.0	13	
Kuper Island	8.54	26	4	1.04	14	1.0	1	1.0	16	Fog 23rd and 28th.
Sooke Lake	14.02	22	6	1.77	6	11.3	5	4.5	11	First ice 10th.
Nas Harbour	5.24	9	18	1.13	30	9.0	3	4.0	12	
Port Essington	14.52	22	8	1.70	29	5.5	2	4.5	12	
N. W. TERRITORIES—										
Whitehead						4.5	3	4.0	15	
Bruderheim	R		24	R	27	7.0	5	3.0	3	
Willow Bunch						7.3	4	4.0	15	
Stirling						6.0	3	6.0	12-14	
Beaver Hills, W.	0.20	1	22	0.20	27	5.6	7	2.0	3	Aurora 9th, 16th, 18th 20th, 21st, 23rd, 25th very heavy fog.
Foxlegh						5.0	4	5.0	14-15	
Conits						10.0	2	10.0	13-14	
Dart Hills						7.0	3	5.5	15	
Lacombe						4.7	5	2.0	15	
Salteoats						5.0	1	5.0	14	
Imis-fail						2.5	4	1.5	14	
Regma						6.3	7	6.0	14-15	
Beaver Hills	0.25	1	26	0.25	27	4.0	3	2.0	22	
MANITOBA—										
Cartwright	0.30	1	27	0.30	8	4.5	3	3.0	10	24th temp—28.
Morton						9.3	6	3.0	15	Aurora 18th.
Oakdale Park						3.0	3	2.5	16	
Morden						9.0	8	4.5	15	
Rapid City	R		23	R	27	5.2	7	4.0	15	
Rathwell						11.4	10	5.4	15	
Norquay						8.0	6	4.0	15	
Gretna						7.5	5	4.5	22	
Belmont						*	5			
ONTARIO—										
Jernyn	0.70	3	23	0.32	16	3.0	4	2.0	29	
Sydenham	1.54	5	25	0.56	23	*	3	*	23	
Midland	0.18	1	21	0.18	11	21.5	6	8.0	17	
Montague	0.51	3	26	0.24	16	0.3	2	0.3	5	
Lansdowne	0.22	1	27	0.22	5	1.0	2	1.0	31	
Wyoming	1.35	3	26	0.75	16	7.0	2	4.0	26	Thunder 16th.
Sunshine	0.70	4	22	0.29	12	5.0	4	2.0	23	
Port Burwell	1.49	4	25	1.14	16	0.3	1	0.3	28	Thunder 16th.
Ursal	0.52	3	23	0.27	11	10.0	4	5.0	23	Thunder 11th, 16th.
Parnia	1.51	3		0.62	16					
Ennismore						4.0	4	4.0	19	
Dutton	2.15	4	22	0.83	16	2.5	3	2.5	28	
Providence Bay	1.52	5	16	0.60	11	9.0	7	6.0	28	
Uxbridge	0.37	3	22	0.22	16	1.5	4	2.0	23	
Aurora	0.60	4	21	0.26	16	5.8	5	2.2	23	
Arden	1.14	7	22	0.31	5	3.0	2	2.0	24	Thunder 12th.
Ensdale	0.66	3	19	0.55	11	13.0	8	3.3	24	Aurora 9th, 18th.
Deer Park	1.02	4	25	0.54	16	2.0	1	2.0	29	
Nottawasaga Island						60.0	6	20.0	19-25	
Westport	1.35	6	23	0.42	16	2.0	1	2.0	18	
Croydon	1.50	3	26	0.60	5	*	2			
Smith's Falls	0.43	2	9	0.30	24	*	7			
Scarboro	1.27	5	23	0.57	16	1.5	4	1.5	29	
Oliver's Ferry	0.21	1	28	0.21	5	1.0	1	1.0	30	
Warton	1.04	4	22	0.45	23	9.2	4	4.0	19	
Orangeville	0.53	2	24	0.28	12	6.4	4	4.6	23	
Godolph	1.20	3	20	0.50	23	15.5	7	4.0	27	
Georgetown	0.94	6	15	0.52	16	8.6	12	3.6	18	Aurora 9th, 14th, 18th, 20th.
Dedtown	2.41	6	21	0.88	16	2.0	5	2.0	29	
Lions Head	0.79	7		0.62	12					
Westminster	2.62	5	24	0.71	16	2.0	1	2.0	25	Thunder 16th.
Wittford	2.27	2		1.67	11	No record				
Huntsville	0.61	2	25	0.55	12	8.5	3	5.0	18	Aurora 18th.
Niagara Falls	0.79	3	26	0.35	5	1.0	1	1.0	26	
NEW BRUNSWICK										
Point Beaumais	2.10	9	17	0.61	18	11.0	5	4.0	29	
NOVA SCOTIA										
Port Morden	4.50	11	18	0.96	30	5.5	3	3.0	15	

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE
SUN WAS ABOVE THE HORIZON IN THE MONTH OF NOVEMBER, 1903.

	HOURS ENDING.																
	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.	
Victoria				0 00	0 04	0 13	0 20	0 21	0 20	0 17	0 12	0 06	0 00	0 00			
Nanaimo				0 00	0 04	0 19	0 11	0 13	0 16	0 16	0 09	0 05	0 00	0 00			
Agassiz				0 00	0 00	0 09	0 16	0 17	0 20	0 21	0 13	0 08	0 03	0 00			
Battleford			03	0 10	0 25	0 36	0 49	0 48	0 49	0 39	0 26	0 06	0 00	0 00			
Indian Head				0 00	0 07	0 14	0 34	0 44	0 52	0 57	0 45	0 22	0 00	0 00			
Brandon				0 00	0 18	0 50	0 51	0 56	0 61	0 59	0 53	0 28	0 07	0 00			
Winnipeg				0 05	0 26	0 34	0 42	0 44	0 43	0 45	0 44	0 27	0 04	0 00			
Woodstock				0 01	0 28	0 43	0 48	0 51	0 43	0 42	0 36	0 28	0 02	0 00			
Toronto				0 08	0 46	0 54	0 63	0 62	0 60	0 51	0 48	0 40	0 06	0 00			
Lindsay				0 10	0 32	0 40	0 53	0 58	0 36	0 50	0 34	0 25	0 11	0 00			
Barrie																	
Gravenhurst				0 08	0 37	0 47	0 48	0 49	0 43	0 38	0 34	0 30	0 14	0 01			
Kingston				0 07	0 33	0 44	0 50	0 55	0 64	0 64	0 55	0 56	0 02	0 00			
Ottawa				0 07	0 26	0 41	0 48	0 45	0 44	0 44	0 41	0 29	0 02	0 00			
Montreal				0 02	0 02	0 16	0 26	0 41	0 52	0 51	0 49	0 44	0 15	0 00			
Quebec				0 01	0 18	0 25	0 30	0 34	0 31	0 37	0 31	0 24	0 05	0 00			
Fredericton				0 02	0 23	0 32	0 39	0 40	0 41	0 44	0 37	0 29	0 06	0 00			
	Victoria.	Nanaimo.	Agassiz.	Battleford.	Indian Head.	Brandon.	Winnipeg.	Woodstock.	Toronto.	Lindsay.	Barrie.	Gravenhurst.	Kingston.	Ottawa.	Montreal.	Quebec.	Fredericton.
Mean proportion for month (Constant sunshine being 1.)	0 12	0 09	0 12	0 32	0 30	0 41	0 35	0 34	0 46	0 39		0 36	0 42	0 34	0 37	0 25	0 31
Difference from average.	0 07	—	0 07	0 01	0 06	0 09	0 00	0 08	0 18	0 14		0 15	0 06	0 07			0 04
Maximum daily amount	0 65	0 64	0 61	0 91	0 78	0 82	0 90	0 84	0 87	0 87		0 91	0 85	0 80	0 98	0 86	0 85
Date.	22	11	21	1	2	2	4	9	3	9		9	12	7	1	11	2
No. of days completely clouded	14	20	21	10	7	8	7	7	8	8		7	3	7	8	9	10

Aurora recorded:—

Where the class of aurora is noted by the observer, it is given, (I) being the brightest, (IV) the feeblest in brilliancy.

1. Hillview, I ; Sutton, *bright* ; Moose Jaw, Edmonton, IV ; White River, II.
5. Rat Portage.
7. Hillview, III.
8. Edmonton, IV.
9. Sherbrooke, Chicoutimi, Hillview, I ; Beatrice, IV ; Rat Portage, Clontarf, IV ; Haliburton, Georgetown, IV ; Beaver Hills W., III ; Desoronto, I ; Gravenhurst, III ; Quebec, III ; Grand Manan, IV.
10. Sutton.
11. Aweme, IV.
12. Threehills Creek, III ; Truro, IV.
13. Gray Hill, IV.
14. Georgetown, IV ; Victoria, Alt., II.
15. Prince Albert, III.
16. Chicoutimi, Beaver Hills W., III ; Gray Hill, III ; Pictou, III ; Onion Lake, II ; Threehills, III.
17. Chicoutimi, Hillview, II ; Aweme, III ; Beaver Hills W., III ; Gray Hill, IV ; Moose Jaw, Battleford, IV ; Prince Albert, II ; Onion Lake, II ; Threehills, II.
18. Sherbrooke, Hillview, II ; Aweme, II ; Beatrice, III ; Bala, Bruce Mines, IV ; Moreton, Emsdale, III ; Georgetown, IV ; Huntsville, IV ; Beaver Hills W., III ; Estevan, Threehills Creek, III ; Melfort, I ; Gray Hill, II ; Wetaskiwin, II ; Gravenhurst, III ; Toronto, III ; Swift Current, IV ; Parry Sound, III ; St. Johns, II ; Battleford, III ; Medicine Hat, II ; Prince Albert, I ; Kingston, II ; Minnedosa, II ; Threehills, III.
19. Aweme, III ; Beaver Hill, IV ; Onion Lake, I.
20. Sherbrooke, Welland, I ; Cottam, Georgetown, IV ; Beaver Hills W., Gray Hill, IV ; Estevan, III ; Truro, IV ; Quebec, IV ; Threehills, III.
21. Perce, III ; Sherbrooke, Hillview, IV ; Aweme, III ; Beaver Hills W., II ; Gray Hill, III ; Estevan, IV ; Wetaskiwin, II ; Pictou, IV ; Truro, IV ; Edmonton, IV ; Minnedosa, IV ; Swift Current, IV ; Threehills, III.
22. Gray Hill, IV ; Edmonton, III.
23. Beaver Hill W., III ; Gray Hill, IV ; Edmonton, IV ; Minnedosa, IV ; Threehills, IV.
26. Threehills, IV.
28. Threehills, IV ; Onion Lake, II.
30. Minnedosa, IV ; Swift Current, IV.

Thunder recorded on:—

2. Bermuda.
3. Bermuda.
7. Clayoquot.
9. W. Kootenay.
11. Ursa, Birnam.
12. Arden, Lakefield.
15. Port Burwell, Westminster, Birnam.
16. Wyoming, Ursa, Port Dover, Welland, Lucknow, London, Port Stanley.
20. Coquitlam, Vancouver, Nanaimo, New Westminster.
28. Truro.

METEORS.

PETERBOROUGH.—November 5th, 6.45 a.m. "A particularly bright meteor was visible, moving from the N. W. apparently in an eastern direction, exploded at the horizon in the N. E. It was the largest and brightest I ever saw."

St. Jous, N.B. November 13th. "Meteor of great brightness at 8.15 p.m."

Truro, N.S. November 13th. "Brilliant meteor 8.15 p.m. moving W.N.W., lighted up the streets and was visible about two seconds."

Captain Hubley of the schooner "Alberta" reports "About 1 o'clock on the morning of November 30th, thirty miles off Seuterie Island during a strong gale, a large meteor was observed in a southern direction; it burst with a terrific shock."

FORECASTS FOR NOVEMBER, 1903.

The forecasts issued by this office at 11 p.m. each night, are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of predictions issued during the month was 1115. These were divided as follows.

DISTRICT.	No. Issued.	VERIFIED.			
		No. Fully	No. Partly	No. Not	Percentage
Manitoba	91	79	7	5	90.7
Lake Superior	115	100	13	2	92.6
Lower Lake Region	118	89	19	10	83.4
Georgian Bay	119	96	15	8	86.9
Ottawa Valley	106	84	14	8	85.8
Upper St. Lawrence	106	82	19	7	86.3
Lower St. Lawrence	114	93	12	9	86.8
Gulf	113	92	13	8	87.2
Maritime Provinces, West.	117	87	20	10	82.9
Maritime Provinces, East.	116	88	20	8	84.5
Total	1115	890	152	73	86.6

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART,
Director

Meteorological Office, Toronto,
28th December, 1903.

DEPARTMENT OF MARINE AND FISHERIES, CANADA

METEOROLOGICAL SERVICE.



Monthly Weather Review.

VOL. XXVII.

DECEMBER, 1903.

No. 12.

INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the material used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

REMARKS UPON THE WEATHER.

Over the lower mainland and islands of British Columbia the weather was comparatively mild and the frosts recorded were generally quite light. Little snow fell and the rainfall which occurred, mostly between the 10th and 22nd, was also quite light in the aggregate. From the 1st to 9th and 23rd to 31st there were some fine bright days, but rain was recorded occasionally. Over the upper mainland the weather was mostly fair up to the 12th, when a somewhat wet period set in lasting to the 21st, fair weather then followed and continued to the 31st, with only an occasional shower.

In the North-west Territories, with the exception of some low temperatures about the 4th and 5th, 11th to 15th, and 22nd to 27th, the weather of December was exceedingly mild. Between 40 and 50 were recorded frequently in Alberta and occasionally in Assiniboia and Saskatchewan. Southerly winds with much sunshine, many quite mild days and little precipitation were the chief features of the weather of the month. The Observer at Calgary reports weather like spring on Christmas Day when cricket and tennis matches were played.

The weather in Manitoba was decidedly cold throughout the greater portion of the month, temperatures below zero occurring very frequently, and between 20 and 30 below being recorded on or about the 12th, 13th, 25th and 26th. In most localities the precipitation was somewhat excessive and late in the month there was enough snow for sleighing. Much cloudiness prevailed and high winds were frequent.

In Ontario the weather was exceedingly cold, more especially from the 14th to 19th, and 26th to 31st, when temperatures well below zero were recorded almost daily in many districts. Light falls of snow were unusually frequent and in most localities the total precipitation of the month, which included heavy rain on the 13th, was excessive. Throughout the greater portion of the month there was good sleighing in most districts. The ice on lakes and rivers was from 7 to 15 inches in thickness on the 31st.

The weather in the Province of Quebec was unusually cold, more especially after the 8th, when temperatures below zero were frequent at most places in western districts; the same conditions also prevailed in the eastern portion of the Province after the 13th. A heavy snowstorm occurred in the western and southern portion on the 10th, when a depth of 10 to 16 inches was recorded. Rain was noted on the 13th and 20th, also at a few southern stations on the 10th.

In New Brunswick the weather remained comparatively mild up to the 14th, when it became quite cold, and although it again moderated for a few days after the 19th, temperatures below zero were occasionally recorded after the former date. The precipitation, which was light, was mostly rain during the first and last week and snow during the intervening period. A heavy gale occurred on the 19th, and strong winds were frequent, the snow being much drifted. On the 30th the ground was bare in many districts but on the following day a fall of snow was general and sleighing was possible throughout the province.

The weather in Nova Scotia followed much the same sequence as in New Brunswick, it being comparatively mild up to the 14th, when it turned cold and although again somewhat milder from the 21st to the 25th, the mean temperature of the month was below the average. Bright sunshine occurred about the 5th to 9th, 14th to 18th, 24th and 28th, also on a few other dates, but the sky was mostly overcast and falls of rain or snow were frequent. High winds were recorded on many days and a heavy gale was noted on the 19th. On the 31st all districts were covered with snow.

In Prince Edward Island the weather conditions were similar to conditions in New Brunswick, low temperatures prevailing after the 13th, with the exception of a short period following the 20th. The precipitation in this Province, however, was somewhat excessive, although the dates upon which it occurred were generally the same. On the 31st the depth of snow at Charlottetown was 6 inches.—F. F. PAYNE.

ATMOSPHERIC PRESSURE.

West of Winnipeg, Man., the mean atmospheric pressure of the month was above average and eastward to the Atlantic it was below. The positive departure was largest in Southern British Columbia whence it decreased gradually eastward to Manitoba; Kamloops, B.C., reported 0.17 inch above average. The largest negative departures were 0.14 inch at Parry Sound, Ont., and 0.12 at St. John, N.B., between these places and from the Lakes to the Atlantic generally the departures were from —.05 to —.10 inch. West of Parry Sound the departure diminished gradually to Winnipeg where the pressure was just average.

HIGH AREAS.

The paths of sixteen areas of high pressure were charted during December. Four areas were confined to the Pacific Coast Region, four to Eastern Canada and one to the Southern part of the Continent. The remaining seven areas first appeared in the North-west States or Territories and assumed a southeasterly and easterly course. Two pronounced cold waves developed during the latter part of the month in areas Nos. 13 and 15 and were generally experienced from Manitoba to the Maritime Provinces. No. 13 moved into the North-west Territories on the 25th and passed southeastward to the Gulf of Mexico. A cold wave developed in this area and spread quickly eastward bringing below zero temperatures very generally as far east as the Maritime Provinces. On the 27th No. 15 appeared over Manitoba and moved southeast to Kentucky and thence northeastward passing south of Nova Scotia during the 29th. The cold weather accompanying it was even more severe than in the previous one.

LOW AREAS.

Eighteen areas of low pressure were charted during the month and of these, fourteen were first observed in the North-west Territories, and moved to the Great Lakes or a little to the northward and thence northeastward toward the Gulf of St. Lawrence. The area which caused the heaviest storm in the Maritime Provinces was first observed in Texas, whence it moved to the Atlantic Coast and northward. In only one instance did a secondary develop near the Middle Atlantic Coast.

The most important areas were Nos. 6, 8 and 9. No. 6 moved northeastward from Texas to the Maritime Provinces between the 8th and 10th, and while over the New England States was reinforced by No. 5 which had formed over the North-west Territories and moved southeastward. The combined system was accompanied by very low barometer readings and heavy gales. No. 8 formed over the Territories on the 10th, and moved southeastward to Oklahoma and thence northeastward and over the Gulf on the 14th, and was also accompanied by very low barometer readings and heavy gales. No. 9 moved from the North-west Territories eastward to the Gulf of St. Lawrence between the 17th and 21st, and, like the former areas, was accompanied by heavy gales and low barometer readings.

WINDS.

In British Columbia, on Vancouver Island and over the mainland the direction favoured somewhat the south and east, but there were many days when it was variable. There were three days with strong and ten with fresh breezes and there was one gale.

In the North-west Territories the direction was very largely between the south and west. There were eight days with strong and eighteen with fresh breezes and three gales.

In Manitoba the direction was also chiefly northerly to westerly with eight days of strong and twelve of fresh breezes and three gales.

In the Lake Region the westerly direction was paramount with ten days of strong and five of fresh breezes as well as ten gales.

In the Ottawa and Upper St. Lawrence Valleys the direction was mainly westerly with eleven days of strong and nine of fresh breezes and seven gales.

In the Lower St. Lawrence Valley and the Gulf the direction was largely westerly, with four days of strong and ten of fresh breezes and nine gales.

In the Maritime Provinces the direction was mainly westerly to northerly with six days of strong and ten of fresh breezes and eight gales.

In the Maritime Provinces where in many districts winter navigation is pursued, the gales occurred on the 3rd, 10th, 13th, 17th, 20th, 22nd, 25th and 30th, the heaviest storms being those of the 10th, 13th, 17th and

20th, whilst those of the 3rd and 25th were only experienced locally. The warnings were generally satisfactory, except that the moderate gales of the 22nd and 30th were not warned and a warning issued on the 27th was not justified by subsequent dangerous winds.

BRIGHT SUNSHINE.

The amount of bright sunshine registered in December was from average to 7 per cent in excess from British Columbia to Western Manitoba, while from Eastern Manitoba to the Maritime Provinces, with local exceptions in Eastern Ontario, it was deficient. Battleford, N.W.T., and Brandon, Man., recorded the largest amount, 31 per cent of the possible, and Woodstock, Ont., the smallest, 12 per cent.

TEMPERATURE.

The mean temperature of December was higher than the average over the North-west Territories and the larger portion of British Columbia, and lower than average over all other parts of the Dominion: the largest positive departures, amounting to nearly 12°, occurred in Western Assiniboia and Northern Alberta, and the largest negative in the more northern portions of Ontario and Quebec. Near the mountains the mildness of the month was almost phenomenal, with but one really cold spell between the 11th and 15th. In Manitoba and eastward, cold weather was pretty steady throughout the month, with the principal cold dips about the middle of the month, and again in Christmas week, when very low temperatures were recorded.

The Highest and Lowest temperatures in each Province during December, 1903, were:

British Columbia,	60°·0 on 25th at Port Simpson.	— 2°·7 on 31st at Stuart's Lake.
North-west Territories,	77°·0 on 8th at Macleod.	— 32°·0 on 12th at Threehills Creek.
Manitoba,	40°·0 on 2nd at Treherne.	— 32°·4 on 13th at Brandon.
Ontario,	51°·0 on 20th at Cockburn Island.	— 17°·0 on 14th at White River.
Quebec,	45°·0 on 20th at Brome.	— 10°·0 on 27th at Chicoutimi.
New Brunswick,	50°·8 on 13th at Grand Manan.	— 15°·0 on 29th at Dalhousie.
Nova Scotia,	54°·0 on 14th at Wolfville.	— 10°·9 on 17th at Parrsboro.
Prince Edward Island,	46°·7 on 13th at Charlottetown.	— 5°·0 on 29th at Hamilton.

Thunder and lightning was reported from the following places: Victoria, B.C., on 19th; Alberni, B.C., on 19th; Port Simpson, B.C., on 25th; Toronto, Ont., on 12th; Bermuda, on 27th.

PRECIPITATION.

The rainfall in British Columbia was very generally about half the average amount and at low levels there was scarcely any snow. In the North-west Territories the snowfall was light, ranging between one and six inches. In Manitoba there was a little more snow, the fall being between 7 inches and 1 foot, or just about average. On the higher lands of Ontario, immediately west of Lake Huron, and in the Muskoka and Nipissing districts, the snowfall was very heavy, but in other parts of the Province there was much less. The only important rainfall occurred in southern districts on the 12th. The precipitation in Quebec was below average in most districts and was chiefly snow, although rain fell about the 13th and 20th. Near Montreal and in the Eastern Townships a very heavy snowfall occurred on the 10th, but in more northern and eastern districts the falls while frequent were only moderate. In the Maritime Provinces the precipitation was above the average and was part rain and part snow, the former predominating. At the close of the month the lower levels of British Columbia and Southern Alberta and Western Assiniboia were bare of snow, but all other parts of the Dominion was snow-covered, the depth being greatest on the higher lands of Western and Northern Ontario and in the Ottawa Valley, the depth in the former districts being from 30 to 60 inches, and in the latter from 20 to 30 inches. In Quebec the depth was about 18 inches in the southwest portion and diminished to about 10 in eastern and northern parts. The greatest depth reported from the Maritime Provinces was a foot at Fredericton, and sleighing was general in all three Provinces.

QUEBEC		81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00
Montreal		157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176
Rimouski		177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196
Quebec		197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216
Chicoutimi		217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236
Chicoutimi		237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256
Chicoutimi		257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276
Chicoutimi		277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296
Chicoutimi		297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316
Chicoutimi		317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336
Chicoutimi		337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356
Chicoutimi		357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376
Chicoutimi		377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396
Chicoutimi		397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416
Chicoutimi		417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436
Chicoutimi		437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456
Chicoutimi		457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476
Chicoutimi		477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496
Chicoutimi		497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516
Chicoutimi		517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536
Chicoutimi		537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556
Chicoutimi		557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576
Chicoutimi		577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596
Chicoutimi		597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616
Chicoutimi		617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636
Chicoutimi		637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656
Chicoutimi		657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676
Chicoutimi		677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696
Chicoutimi		697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716
Chicoutimi		717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736
Chicoutimi		737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756
Chicoutimi		757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776
Chicoutimi		777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796
Chicoutimi		797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816
Chicoutimi		817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836
Chicoutimi		837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856
Chicoutimi		857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876
Chicoutimi		877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896
Chicoutimi		897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916
Chicoutimi		917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936
Chicoutimi		937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956
Chicoutimi		957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976
Chicoutimi		977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996
Chicoutimi		997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016
Chicoutimi		1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036
Chicoutimi		1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056
Chicoutimi		1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076
Chicoutimi		1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096
Chicoutimi		1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116
Chicoutimi		1117	1118	1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136
Chicoutimi		1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156
Chicoutimi		1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176
Chicoutimi		1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196
Chicoutimi		1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216
Chicoutimi		1217	1218	1219	1220	1221	1222	1223	1224	1225	1226	1227	1228	1229	1230	1231	1232	1233	1234	1235	1236
Chicoutimi		1237	1238	1239	1240	1241	1242	1243	1244	1245	1246	1247	1248	1249	1250	1251	1252	1253	1254	1255	1256
Chicoutimi		1257	1258	1259	1260	1261	1262	1263	1264	1265	1266	1267	1268	1269	1270	1271	1272	1273	1274	1275	1276
Chicoutimi		1277	1278	1279	1280	1281	1282	1283	1284	1285	1286	1287	1288	1289	1290	1291	1292	1293	1294	1295	1296
Chicoutimi		1297	1298	1299	1300	1301	1302	1303	1304	1305	1306	1307	1308	1309	1310	1311	1312	1313	1314	1315	1316
Chicoutimi		1317	1318	1319	1320	1321	1322	1323	1324	1325	1326	1327	1328	1329	1330	1331	1332	1333	1334	1335	1336
Chicoutimi		1337	1338	1339	1340	1341	1342	1343	1344	1345	1346	1347	1348	1349	1350	1351	1352	1353	1354	1355	1356
Chicoutimi		1357	1358	1359	1360	1361	1362	1363	1364	1365	1366	1367	1368	1369	1370	1371	1372	1373	1374	1375	1376

PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c., DURING
DECEMBER, 1903.

STATIONS.	RAIN FALL.					SNOWFALL.					REMARKS.
	Amount in inches.	No. of Days or Over.	No. of Fair Days.	Heaviest Fall in Month	Date.	Amount in inches.	No. of Days.	Heaviest Fall in Month	Date.		
BRITISH COLUMBIA—	in.			in.		in.		in.			
Naas Harbour	9.34	11	17	1.53	1	3.0	3	1.0	6		
Couquitlam	6.96	18	13	1.86	20						
Kuper Island	3.55	16	15	0.56	19					Dense fog 7th to 10th.	
Goldstream Lake	5.83	18	13	1.38	20					Fog 4th, 8th, 9th, 10th,	
Nanaimo	3.43	6	25	1.43	14					23rd, 25th, 27th, 30th.	
Sooke Lake	6.65	14	17	1.62	20						
Royal Oak	3.09	15	16	0.60	14						
Port Essington	12.87	23	8	1.65	1	0.3	1	0.3	12		
N. W. TERRITORIES—											
Regina			27			6.0	4	1.0	3	Very little snow on ground.	
Dirt Hills			26			8.0	5	4.0	2		
Bruderheim	0.05	1	26	0.05	1	3.0	4	1.0	2	26th, Terrible wind storm.	
Beaver Hills, W.	0.08	1	25	0.08	1	5.0	6	1.8	1	31st, Sleighing good.	
Innisfail	0.17	1	27	0.17	24	3.0	4	2.2	10		
Salteoats			29			1.5	2	1.0	10		
Whitewood						2.5	2	2.0	20		
Foxleigh						11.7	6	3.0	2	11th, temp.—38.	
Stirling						10.0	5	4.0	4		
Beaver Hills, E.	0.45		25	0.45	1	2.5	5	1.0	31		
Willow Bunch						6.3	5	3.0	3		
Victoria	1.05	1	29	1.05	1	0.3	1	0.3	23		
Combs											
MANITOBA—											
Rapid City	R	0	21	R	1	2.7	8	1.0	9		
Gretna			19			16.5	12	8.0	3		
Deloraine	0.03	1	13	0.03	3	12.7	13	2.0	3	31st, Snow on stubble 10".	
Norquay			8			11.5	8	2.5	9	Blizzard 11th, 12th.	
Rathwell			14			12.2	15	3.0	20	Blizzard 3rd.	
Belmont			24								
Morden	R		16			9.5	15	4.0	3	Blizzard 3rd.	
Cartwright			26			5.7	5	2.0	3	12th, temp.—34, 13th,—33°.	
ONTARIO—											
Deer Park	1.46	5	20	0.69	13	6.0	8	1.8	29		
Wyoming			23			22.0	8	4.0	19		
Watford	1.40	3		0.60	19	No record	of snow.				
Oliver's Ferry	0.40	3	25	0.30	14	5.0	4	2.0	7		
Uxbridge	0.66	3	12	0.57	12	26.0	17	6.5	12	28th,—25°.	
Dealtown	1.67	4	20	0.90	12	6.0	7	0.5	1		
Lansdowne	R		25	R	29	4.5	5	2.0	20		
Eamsmore	R		24	R		16.0	7	3.0	6		
Wharton	0.53	2	13	0.27	19	50.5	16	5.0	12		
Scarboro'	1.26	3	12	0.62	20	8.3	18	3.5	12		
Port Burwell	1.32	2	20	0.70	12	15.0	9	4.0	1	27th, Fearful blizzard.	
Jennyn	R		25			16.0	6	4.0	12	28th,—20°.	
Georgetown	0.96	4	3	0.37	13	30.2	28	6.3	15	Aurora 13th, fog 4th.	
Croydon	1.40	3	19	0.60	20	27.0	11	6.0	27		
Montague	0.57	3	21	0.26	20	8.0	8	2.0	27	26th,—16°.	
Parnham	0.34	1	26	0.34	24	10.0	4	1.0	11		
Niagara Falls	1.42	4	22	0.67	12	8.0	5	3.0	11		
Arden	1.08	4	17	0.46	21	25.0	14	4.0	28		
Dutton	3.01	3	18	1.75	12	13.7	10	2.3	2		
Providence Bay	0.41	2	14	0.40	20	44.5	17	8.0	12	13th, Blizzard.	
Midland	R		18	R		50.3	13	12.0	15		
Ursa	1.50	1	12	1.50	12	48.0	19	7.0	20		
Westminster			25			15.0	6	6.0	20		
Aurora	0.55	2	18	0.51	12	17.8	11	6.3	12		
Sunshine			9			42.7	22	1.0	19		
Westport	0.15	1	21	0.15	20	17.5	10	6.0	27		
Huntsville	R		17	R		41.5	14	15.0	11		
Sydenham	1.44	3	21	0.62	19	28.0	9	12.0	26		
Orangeville			17			34.6	14	15.2	13		
Colerich	0.80	3	16	0.36	24	43.0	14	6.0	13		
Ensdale			14			18.3	17	8.0	13	13th, Blizzard, 31st 42	
Smith's Falls	0.56	2	22	0.30	25	14.5	7	4.0	29	snow on ground.	
NEW BRUNSWICK—											
Point Escommac	0.41	3	24	0.23	13	13.2	4	10.0	3		
NEW SCOTIA—											
Port Morden	2.37	7	16	1.20	3	15.5	8	7.0	30		

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE
SUN WAS ABOVE THE HORIZON IN THE MONTH OF DECEMBER, 1903.

	HOURS ENDING.													
	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.
Victoria				0 00	0 06	0 20	0 24	0 24	0 18	0 23	0 20	0 01	0 00	
Nanaimo				0 00	0 00	0 11	0 20	0 20	0 16	0 21	0 20	0 07	0 00	
Agassiz				0 00	0 01	0 05	0 17	0 20	0 25	0 20	0 18	0 09	0 00	
Battleford				0 15	0 32	0 37	0 37	0 41	0 39	0 35	0 15	0 01	0 00	
Indian Head				0 00	0 00	0 19	0 31	0 48	0 54	0 55	0 37	0 02	0 00	
Brandon				0 00	0 00	0 26	0 39	0 45	0 45	0 40	0 38	0 12	0 03	
Winnipeg				0 00	0 00	0 12	0 30	0 37	0 46	0 44	0 33	0 01	0 00	
Woodstock				0 00	0 01	0 11	0 18	0 18	0 20	0 21	0 15	0 06	0 00	
Toronto				0 00	0 12	0 27	0 29	0 32	0 31	0 31	0 26	0 17	0 00	
Lindsay				0 00	0 12	0 18	0 24	0 28	0 23	0 17	0 09	0 14	0 06	
Gravenhurst				0 07	0 20	0 41	0 39	0 36	0 32	0 31	0 36	0 20	0 02	
Barrie														
Kingston				0 00	0 12	0 27	0 36	0 44	0 40	0 36	0 29	0 14	0 00	
Ottawa				0 00	0 01	0 14	0 27	0 35	0 30	0 30	0 29	0 06	0 00	
Montreal				0 00	0 00	0 11	0 21	0 28	0 35	0 27	0 22	0 06	0 00	
Quebec				0 00	0 07	0 20	0 39	0 39	0 34	0 30	0 21	0 03	0 00	
Fredericton				0 00	0 13	0 44	0 45	0 41	0 43	0 45	0 27	0 06	0 00	
	Victoria.	Nanaimo.	Agassiz.	Battleford.	Indian Head.	Brandon.	Winnipeg.	Woodstock.	Toronto.	Lindsay.	Barrie.	Gravenhurst.	Kingston.	Ottawa.
Mean proportion for month (Constant sunshine being 1.)	0 16	0 14	0 14	0 31	0 30	0 31	0 25	0 12	0 23	0 17		0 29	0 27	0 19
Difference from average.	0 00	—	0 00	0 04	0 07	0 04	0 11	0 08	0 00	0 04		—	0 02	0 01
Maximum daily amount	0 77	0 74	0 70	0 93	0 65	0 93	0 74	0 76	0 85	0 94		0 84	0 80	0 72
Date.	2	2	9	12	28	31	31	22	24	26		14	28	28
No. of days completely clouded	12	19	21	10	9	13	10	23	10	15		13	14	11

Aurora recorded :—

Where the class of aurora is noted by the observer, it is given, (I) being the brightest, (IV) the feeblest in brilliancy.

1. Swift Current, IV.
4. Battleford, IV.
9. Battleford, IV.
10. Toronto, III.
13. Battleford, IV ; St. John, III ; Georgetown, IV ; Sherbrooke, Moose Jaw, Melfort, Onion Lake, III ;
Threehills, II.
14. Battleford, IV.
20. Edmonton, IV ; Melfort, IV ; Onion Lake, III ; Threehills, III.
21. Edmonton, III ; Minnedosa, III ; Prince Albert, I ; Melfort, I.
30. Calgary, IV ; Threehills, III.
31. Port Arthur, II ; Rat Portage, III.

FORECASTS FOR DECEMBER, 1903.

The forecasts issued by this office at 11 p.m. each night, are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of predictions issued during the month was 1106. These were divided as follows :—

DISTRICT.	No. Issued.	VERIFIED.			
		No. Fully	No. Partly	No. Not	Percentage
Manitoba.....	87	67	15	5	85.6
Lake Superior ..	91	68	18	5	84.6
Lower Lake Region.....	123	90	25	8	83.3
Georgian Bay.....	121	82	30	9	80.2
Ottawa Valley ..	100	75	17	8	83.5
Upper St. Lawrence.....	100	73	19	8	82.5
Lower St. Lawrence ..	116	98	14	4	90.5
Gulf.....	116	103	8	5	92.2
Maritime Provinces, West.....	126	94	18	14	81.7
Maritime Provinces, East.....	126	95	19	12	82.9
Total	1106	845	183	78	84.7

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART,

Director

Meteorological Office, Toronto,
27th January, 1904.

P
Astron.
Can.

Canada. Meteorological Service

Monthly weather review 1903.

Author

Title

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